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SULFADIAZINE

THERAPEUTIC EVALUATION AND TOXIC EFFECTS ON FOUR HUNDRED AND FORTY-SIX PATIENTS

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Sulfadiazine (2-sulfanilamidopyrimidine), the pyrimidine analogue of sulfapyridine and sulfathiazole, is one of a group of heterocyclic derivatives of sulfanilamide synthesized by Roblin and his co-workers.[1] Laboratory studies on animals indicated that this drug has less toxicity than sulfapyridine and sulfathiazole and is highly effective against experimental infections with common pathogens.[2] Preliminary observations in this clinic[3] and in a number of others in which sulfadiazine was made available[4] indicated that this drug was worthy of extensive trial in the therapy of human bacterial infections. This paper deals mainly with a report of the clinical use of sulfadiazine in 446 adult patients treated at the Boston City Hospital prior to March 1, 1941. The results of laboratory studies will be reviewed briefly.

ANIMAL EXPERIMENTS

Feinstone and his associates[2] have shown that sulfadiazine is considerably less toxic than sulfapyridine or sulfathiazole both in acute experiments on mice and after prolonged administration in monkeys. In these animals and in rabbits absorption of sulfadiazine after oral administration was rapid, there was little acetylation and the levels of the free drug reached were higher and were maintained longer than after similar doses of sulfapyridine or sulfathiazole. Because of these observations, comparisons of efficacy were difficult to evaluate. When identical doses were used in mice, however, sulfadiazine was found to be considerably more effective than the other drugs in the therapy of experimental infections with pneumococcus, hemolytic streptococcus and Friedländer's bacillus type B and about as effective as sulfathiazole against the staphylococcus. Long[5] has also found sulfadiazine to be effective in mice against infections with these organisms and, in addition, against Escherichia coli, Clostridium welchii and Clostridium septicum infections.

ABSORPTION, EXCRETION AND DISTRIBUTION IN MAN[6]

In human subjects the maximum blood levels after oral administration of sulfadiazine are uniformly higher and are more sustained than after corresponding doses of the other sulfonamides now in common use. Little of the drug appears in the blood in the conjugated form. Excretion of the drug is somewhat delayed; it is recovered almost entirely in the urine, and about one third of the excreted drug is recovered as the acetylated compound. The appearance of the drug in the cerebrospinal fluid even after intravenous administration of the sodium salt is somewhat delayed, but the drug soon reaches and maintains a level about two thirds of that found in the blood. In other exudates, the concentrations more nearly approximate those of the blood. Neither sulfadiazine nor its sodium salt is absorbed to any significant degree from the rectum.

The drug is distributed in the various organs of the body in about the same manner as is sulfathiazole. In the kidney, however, the concentration of sulfadiazine usually is the same as in the blood. In this respect it resembles sulfanilamide and is in contrast to sulfapyridine and sulfathiazole, which are found in the kidney in considerably higher concentrations than in the blood.[7] The solubility of the acetyl sulfadiazine in urine is much higher than that of acetyl derivatives of sulfapyridine and sulfathiazole.[7] The latter condition is of interest in view of the fact that many patients with impaired renal function excrete the free and conjugated sulfadiazine more readily than is usually the case with sulfapyridine or sulfathiazole. This will appear from the data to be presented and was also mentioned by Long.[5]

IN VITRO STUDIES

It is now recognized that body fluids as well as the usual laboratory mediums contain substances which inhibit sulfonamide action. Different mediums vary con-

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This study was carried out with the technical assistance of Mildred W. Barnes and Clare Wilcox, who also assisted in collecting the data. The chemical determinations were made by Elizabeth Shaler Smith and Alice N. Ballou. The visiting and house staffs of the medical services cooperated in this work. The sulfadiazine and specific serums used in this study were supplied by the Lederle Laboratories, Inc.

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3. Peterson, O. L.; Strauss, Elias; Taylor, F. H. L., and Finland, Maxwell: Absorption, Excretion and Distribution of Sulfadiazine (2-Sulfanilamido-Pyrimidine), Am. J. M. Sc. **201**: 357 (March) 1941.

4. Plummer, Norman, and Ensworth, H. K.: Absorption and Excretion of Sulfadiazine, Proc. Soc. Exper. Biol. & Med. **45**: 734, 1940. Rheinhold, J. G.; Flippin, H. F.; Schwartz, Leon, and Domm, A. H.: The Absorption, Distribution, and Excretion of 2-Sulfanilamido Pyrimidine (Sulfapyrimidine, Sulfadiazine) in Man, Am. J. M. Sc. **201**: 106 (Jan.) 1941. Long.[5] Sadusk and Tredway.[6] Bullowa.[20]

5. Long, P. H.: The Clinical Use of Sulfanilamide, Sulfapyridine, Sulfathiazole, Sulfaguanidine and Sulfadiazine in the Prophylaxis and Treatment of Infections, Canad. M. A. J. **44**: 217 (March) 1941.

6. Sadusk, J. F., Jr., and Tredway, J. B.: Observations on the Absorption, Excretion, Diffusion and Acetylation of Sulfadiazine in Man, Yale J. Biol. & Med. **13**: 539 (March) 1941. Peterson, Strauss, Taylor and Finland.[3] Plummer and Ensworth.[4] Rheinhold, Flippin, Schwartz and Domm.[4] Long.[5]

7. Strauss, Elias; Lowell, F. C.; Taylor, F. H. L., and Finland, Maxwell: Observations on the Absorption, Excretion and Distribution of Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole, Ann. Int. Med. **14**: 1360 (Feb.) 1941. Peterson, Strauss, Taylor and Finland.[3]

siderably in the degree to which they inhibit the antibacterial action of any given drug.[8] Our studies indicate that, in addition, a given medium may inhibit the activity of different drugs to varying degrees. It is usually not possible to determine to what extent variations in the action of different sulfonamides on any given organism are due to differential inhibition by the mediums or to intrinsic differences in the activity of the drugs, or to both these factors. In certain synthetic mediums of known composition, sulfonamide action is frequently enhanced one hundred fold or more over its effectiveness in the common infusion broths.

Previous experiments with pneumococci have indicated that the blood broth medium used in this laboratory could be used for comparative studies with sulfapyridine and sulfathiazole.[9] In this medium sulfadiazine is much less bacteriostatic than sulfapyridine or sulfathiazole. Similar results with pneumococci were noted by Osgood and Bullowa in cultures taken from bone marrow.[10] In pneumococcidal tests carried out in defibrinated human blood with a technic previously described,[11] however, sulfadiazine was found to be about as effective as sulfathiazole. In all other mediums tested sulfadiazine was less effective against pneumococci than were sulfathiazole and sulfapyridine except in a liver infusion medium,[8] which presumably contains the least inhibitor for all three drugs and in which all these drugs were about equally effective. In this medium a pneumococcus made fast to sulfapyridine and sulfathiazole[9] was also found to be fast to sulfadiazine.

Against Staphylococcus aureus, when a simple liver infusion medium was used,[8] sulfadiazine was somewhat less bacteriostatic than sulfathiazole but considerably more effective than sulfapyridine. In a completely synthetic medium[12] or in a simple medium[13] sulfadiazine was highly bacteriostatic against stock laboratory strains of Friedländer's bacillus types A and B, Flexner dysentery bacillus, Salmonella suipestifer, Salmonella enteritidis, Salmonella paratyphosus A and B, Salmonella aertrycke and Escherichia coli communis. In most of the experiments sulfadiazine had about the same effect as sulfathiazole and in the others it was somewhat less effective in the same concentrations. In urine, also, sulfadiazine is as effective against these organisms as sulfathiazole. As with other sulfonamides,[14] the bacteriostatic and bactericidal action of sulfadiazine is inhibited by para-aminobenzoic acid.

TABLE 1.—*Etiologic Factors and Mortality in Pneumonia Treated with Sulfadiazine*

Etiologic Classification	Number of Patients *	Died *	Per Cent Died
A. Pneumococcic pneumonia	178 (33)	19 (8)	10.7
Type I	28 (11)	2 (2)	
II	6 (1)	0	
III	33 (6)	6 (3)	
IV	11 (1)	2	
V	12 (2)	0	
VII	18 (5)	6 (3)	
VIII	18 (4)	0	
Others	52 (3)	3	
B. Specific, nonpneumococcic pneumonia	35 (7)	7 (2)	20.0
Staphylococcus aureus, alone	21 (3)	4	
With hemolytic streptococcus	5 (1)	1 (1)	
With influenza bacillus	3	1	
Hemolytic streptococcus	4 (2)	0	
Friedländer's bacillus, type A	2 (1)	1 (1)	
C. Etiology undetermined—"primary" pneumonia	52	3	5.8
Lobar pneumonia	20	0	
Atypical pneumonia	32	3	
D. Etiology undetermined—"secondary" pneumonia	51	19	37.3
Cerebrovascular accidents	13	6	
Cardiac failure	29	7	
Acute asthma	4	2	
Other serious disease	5	2	
All pneumonias	316 (40)	48 (10)	15.2

* Parentheses indicate number of patients with positive blood cultures.

CLINICAL RESULTS

The laboratory evidence that sulfadiazine has a wide range of effectiveness, the relatively high concentrations of this drug that are so readily maintained in animals and in human beings and its low toxicity which became apparent from the first clinical trials led us to attempt an evaluation of its therapeutic effect in all cases of bacterial infections in which sulfonamides might prove useful. Sulfadiazine was therefore used as the only sulfonamide drug in five of the medical wards beginning November 1 and in three additional wards beginning January 1. Other sulfonamide drugs were used in these wards only while the supply of sulfadiazine was exhausted and in some patients when it became apparent that the response to sulfadiazine was not adequate. As the study progressed, it became necessary, because of the limited supply of the drug available, to exclude from sulfadiazine therapy patients with mild infections when it was felt that an etiologic bacterial incitant would not be identified. The present report includes 446 consecutive patients in whom treatment with sulfadiazine was begun before March 1. Three hundred and sixteen of these patients were treated for pneumonia. The results of treatment in this group will be analyzed in some detail. The remaining patients were treated for a large variety of infections. The clinical results in this group will be summarized briefly and the toxic effects in both groups will be noted.

RESULTS IN PNEUMONIA

In general, the results of sulfadiazine treatment in pneumonia (tables 1 to 4) compared favorably in every way with those obtained during the previous year with sulfapyridine and sulfathiazole,[15] and the cases were quite comparable as judged by the incidence of various factors which are known to influence the prognosis. Some of the pneumonias occurred as a complication of clinical influenza which occurred in epidemic form during part of this study. In a number of these cases, which will be described in detail elsewhere, the staphylococcus appeared to be the inciting agent in the pulmonary process. Others in which there were pulmonary lesions in which significant pathogens were not obtained on culture are included under the "primary" pneumonias of undetermined etiology.

8. MacLeod, C. M.: The Inhibition of the Bacteriostatic Action of Sulfonamide Drugs by Substances of Animal and Bacterial Origin, J. Exper. Med. **72**: 217 (Sept.) 1940.

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10. Bullowa, J. G. M.: Personal communication to the authors.

11. Finland, Maxwell, and Brown, J. W.: Immunological Studies in Patients with Pneumococcus Type III Pneumonia Treated with Sulfanilamide, J. Clin. Investigation **18**: 307 (May) 1939. Spring, W. C.; Lowell, F. C., and Finland, Maxwell: Studies on the Action of Sulfapyridine on Pneumococci, ibid. **19**: 163 (Jan.) 1940.

12. Fildes, P.: Mechanism of the Antibacterial Action of Mercury, Brit. J. Exper. Path. **21**: 67, 1940.

13. Sahyun, Melville; Beard, P.; Schultz, E. W.; Snow, J., and Cross, E.: Growth Stimulating Factors for Microorganisms, J. Infect. Dis. **58**: 28, 1936. MacLeod.[8]

14. Strauss, Elias; Lowell, F. C., and Finland, Maxwell: Observations on the Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid, J. Clin. Investigation **20**: 187 (March) 1941.

15. Finland, Maxwell; Lowell, F. C., and Strauss, Elias: Treatment of Pneumococcic Pneumonia with Sulfapyridine, Sulfathiazole and Serum, Ann. Int. Med. **14**: 1184 (Jan.) 1941.

Pneumococcic Pneumonias.—There were 19 deaths among the 178 patients with pneumococcic pneumonia treated with sulfadiazine, a mortality of 10.7 per cent. During the previous season[15] there were 112 deaths among 687 patients treated with sulfapyridine or sulfathiazole with or without specific serums, a mortality of 16.3 per cent. Among the sulfadiazine treated patients 33, or 19 per cent, had positive blood cultures before treatment and 8 of these bacteremic patients died (26 per cent). More than one lobe was involved in 62, or 35 per cent, of the 178 patients; 59 per cent were over 40 years of age and 26 per cent were more than 60. The incidence of these important prognostic factors in the present series is similar to that found in the pneumococcic pneumonias during the previous year, but the mortality was slightly lower in each of the corresponding groups of sulfadiazine treated patients.

Specific antipneumococcus serums were given to supplement the chemotherapy to 16 of these patients, of whom 6 died. Ten of the recipients of serum, including 5 who died, had positive blood cultures before therapy was started.

Complications in the patients with pneumococcic pneumonias were relatively few. A sterile pleural effusion was demonstrated in 10 patients, conjunctivitis in 1, suppurative otitis media in 4, empyema in 2 and both empyema and fibrinous pericarditis in 1. The latter patient required rib resection for the empyema, while all the others recovered completely without surgical intervention.

Of the fatalities 8 patients were moribund at the time of admission and only 1 of these lived for more than twenty-four hours after the first dose of sulfadiazine. Only 2 other patients may be said to have died of the pneumococcic infection: One was a woman aged 40 who died of vegetative pneumococcic (type VII) endocarditis and old rheumatic heart disease; the other was an alcoholic patient aged 27 with severe leukopenia (1,400 per cu. mm.) and involvement of the entire right lung who had a persistent type VII pneumococcic bacteremia during four days of sulfadiazine therapy. He was then given serum and died the following day. Autopsy revealed abscess formation in the consolidated lung; the cardiac blood was sterile. The 9 other fatalities were of aged patients who died of various untoward events not directly related to the pneumococcic infection and after the latter had apparently been overcome.

The specific antibody response of a number of the patients who recovered was studied and was found to be similar to that of patients who recovered following sulfapyridine therapy.[16]

Other Specific Pneumonias.—The 35 pneumonia patients with pathogenic organisms other than pneumococci were, for the most part, severely ill at the time of admission to the hospital. Most of the cases in which the staphylococcus was predominant occurred as a complication of epidemic influenza. Recovery following chemotherapy in some of these cases was prompt and complete. In others, in spite of continued therapy, there was prolonged illness with clinical and roentgen evidence of abscess formation and localized pleural effusion. All except 1 patient recovered completely before discharge from the hospital.

Six of the deaths occurred among the patients with staphylococcic pneumonias. Three of these were of patients with the fulminating type of rapidly spreading pneumonia complicating influenza, and death occurred within forty-eight hours of admission to the hospital. Culture of the blood of one of these patients taken before treatment yielded hemolytic streptococci but a culture of the sputum showed a predominance of staphylococci. Death occurred after thirty-six hours. At autopsy there was diffuse hemorrhagic pneumonia with ulcerative bronchitis and multiple abscesses. The contents of the abscesses yielded an abundant growth of staphylococci, but the cardiac blood was sterile. The other three deaths were of patients aged 64, 76 and 81 who died fourteen, sixteen and eight days, respectively, after chemotherapy was started. All were severely ill and showed temporary improvement under therapy. One of these patients died of pulmonary infarcts from thrombophlebitis. One of the others had multiple staphylococcic abscesses in the lung at necropsy.

Fluid was obtained by thoracentesis on 6 of the patients with staphylococcic pneumonia who recovered. The original pleural fluid and subsequent ones of 2 were all sterile. Of the remaining 4, all of whom had pleural exudates which were infected with staphylococci, 2 recovered completely under sulfadiazine therapy and repeated aspirations, while the others underwent surgical drainage by rib resection.

The 4 patients with primary streptococcic pneumonia were all severely ill and 2 had positive blood cultures at the time sulfadiazine treatment was begun. All these patients recovered completely. Two of them, including one with bacteremia, had empyema which cleared up completely with chemotherapy and repeated thoracentesis and did not require surgical intervention.

Two patients with pneumonia of type A Friedländer's bacillus were treated with sulfadiazine. One was a man aged 51 who had a negative blood culture and an atypical pneumonia involving the entire left lung at the time of admission. Chemotherapy was started before the end of the first day and the patient was afebrile and relieved of acute symptoms after sixteen hours. The other patient was a man aged 46 who had been ill six days, had a positive blood culture and a leukocyte count of 2,500 per cubic millimeter at the time sulfadiazine therapy was started. He died twenty-six hours later in spite of intensive therapy, including intravenous sodium sulfadiazine and specific rabbit antiserum.

Non-Pneumococcic Pneumonias.—The mortality in all the 138 cases of pneumonia treated with sulfadiazine in which pneumococci were not obtained (including those in which specific bacteria were involved) was 21 per cent, as compared with 23 per cent in the corresponding group of 95 treated with sulfathiazole during the previous year.[15] In both groups the mortality was higher in the atypical pneumonias (bronchopneumonia) and in those secondary to other serious illness than it was in the lobar pneumonias and in the primary pneumonias, respectively.

Effect of Age on Mortality (table 2).—This was most striking in the pneumococcic pneumonias (group A) and in the pneumonias classified as "primary" in which a definite etiologic agent was not identified (group C). Among the latter there were no deaths among 30 patients under 50 years of age, while less than 3 per cent of the 104 patients with pneumococcic pneumonia in this age group died. Among the specific non-pneumococcic pneumonias (group B) and the "sec-

16. Finland, Maxwell; Spring, W. C., Jr., and Lowell, F. C.: Immunological Studies on Patients with Pneumococcic Pneumonia Treated with Sulfapyridine, J. Clin. Investigation **19**: 179 (Jan.) 1940.

ondary" pneumonias (group D) the mortality of patients over 50 was about twice as high as that of those under 50 years of age.

Dosage of Sulfadiazine Used in the Pneumonias (table 3).—Most of the patients received an initial dose of 2 or 4 Gm. and then 1 Gm. every four hours

TABLE 2.—*Mortality in Pneumonia Treated with Sulfadiazine: Effect of Age*

Age, Years	A No.	A Died	B No.	B Died	C No.	C Died	D No.	D Died	All Patients No.	All Patients Died	All Patients Per Cent
13-19	12	0	7	1	1	0	1	0	21	1	5
20-29	39	2	5	0	9	0	3	1	57	3	5
30-39	41	0	6	0	8	0	2	1	57	1	2
40-49	31	1	7	3	9	0	4	0	51	4	8
50-59	28	4	2	0	3	0	11	3	44	7	16
60-69	24	4	3	1	10	1	13	4	50	10	20
70-79	17	4	4	1	10	1	13	8	44	14	32
80+	5	4	1	1	2	1	4	2	12	8	75
Totals	178	19	35	7	52	3	51	19	316	48	15.2
	Percentage Mortality										
All patients	10.7		20.0		5.8		37.5		15.2		
Under 50	2.9		16.0		0		20.0		5.4		
Over 50	21.6		30.0		12.0		41.5		26.0		

A, B, C and D refer to groups of patients as listed in table 1.

until the drug was discontinued—usually three to five days after the fever had entirely subsided. In some of the wards the dosage was reduced to 1 Gm. every six hours after the patient became afebrile. Some of the patients with the severest attacks received an initial dose of 5 Gm. of sodium sulfadiazine either in 100 cc. or more of saline solution intravenously or in a liter of physiologic solution of sodium chloride subcutaneously (as recommended by Taplin [17]). About three fourths of the patients who recovered were treated for six days or less and received less than 40 Gm. of the drug. The average dose among the patients with pneumococcic pneumonias who recovered was 38 Gm. The bacteremic patients received an average of 8 Gm. more than those with negative blood cultures. There was a general tendency, especially in the earlier part of this study, to continue the chemotherapy longer than was indicated. This was definitely attributable to the low toxicity of the drug. It was also noted during the previous year that sulfathiazole treated patients were given the drug an average of one day longer than those who received sulfapyridine. With the latter, nausea and vomiting were more frequent and more severe.

Sulfathiazole was used instead of sulfadiazine during part of the course in 28 cases of pneumonia. In more than half of these cases the sulfathiazole was used for one or two days to maintain treatment after essential recovery had taken place under sulfadiazine, while the supply of the latter was exhausted. Larger amounts were used mainly in the treatment of febrile complications. In 9 cases of pneumococcic pneumonia an average of 23 Gm. of sulfathiazole was used in addition to 31 Gm. of sulfadiazine. Four patients with staphylococcic pneumonias, including the 2 who had a rib resection for empyema, received an average of 75 Gm. of sulfathiazole in addition to 54 Gm. of sulfadiazine.

Duration of Acute Illness (table 4).—Among the 159 patients with pneumococcic pneumonia who recovered following sulfadiazine therapy alone or supplemented with serum (group A), 75 per cent were essentially afebrile and recovered within thirty-six hours after the first dose of the drug. During the previous season [18] about 68 per cent of the patients with corresponding conditions had a similar response to either sulfapyridine or sulfathiazole. Recovery in a large proportion of the patients with specific non-pneumococcic pneumonias (group B) was delayed owing to the presence of febrile complications, as already noted. In about one third of all the fatal cases death occurred within thirty-six hours after treatment was started. In most of the others there was obvious and sometimes striking improvement following sulfadiazine treatment at first, and death occurred several days later as a result of complicating conditions.

RESULTS IN INFECTIONS OTHER THAN PNEUMONIA

Sulfadiazine was used in the treatment of 130 patients with a variety of infections. The diseases treated are listed in table 5 with the average total amount of drug used and an estimation of the curative effect of the drug in each condition. It is possible here to mention only briefly a few of the salient features concerning each of the groups of cases:

Acute Infections of the Upper Respiratory Tract.—The 40 patients included in this group all appeared acutely ill when chemotherapy was started. Many of them had scattered musical and crepitant rales throughout the lungs and were suspected of having pneumonia, but roentgenograms showed no evidence of pulmonary consolidation. Eighteen of the patients were admitted to the hospital during an epidemic of influenza and had characteristic symptoms of this disease with moderate or severe tracheobronchitis. All these patients recovered rapidly and completely soon after sulfadiazine treatment was started, but it is not possible in most instances to evaluate the role of the drug in the recovery or in the prevention of complications. The 4 patients with sinusitis all had severe symptoms and high fever, and 1 had a positive blood culture for Staphylococcus aureus before therapy. All were noticeably improved and essentially afebrile within fifteen to thirty-six hours after the first dose of sulfadiazine. In 1 of the 2 cases of otitis media, hemolytic streptococci and staphylococci

TABLE 3.—*Dosage of Sulfadiazine Used in Treatment of Pneumonia*

Dose, Gm.	Pneumococcic Pneumonia: Recovered Cases	Pneumococcic Pneumonia: Fatal Cases	All Pneumonias: Recovered Cases	All Pneumonias: Fatal Cases
10 or less	4	7	7	19
11-20	18	4	36	12
21-30	54	3	94	7
31-40	44	2	67	2
41-50	18	1	29	4
51-75	19	3	27	4
76 or more	3	0	8	0
Average dose				
All cases	38	23	37	30
Bacteremic	44	33		
Nonbacteremic	36	17		

were cultured from the purulent exudate, which cleared completely in two days. In the other the purulent discharge, from which Staphylococcus aureus was cultured, continued for several days in spite of full doses of sulfadiazine and finally cleared. In the latter case a course of sulfathiazole therapy had previously been given without benefit.

Erysipelas and Scarlet Fever.—The results of therapy in 8 patients with facial erysipelas were uniformly good.

17. Taplin, G. V.; Jacox, R. F., and Howland, J. W.: The Use of Sodium Sulfapyridine by Hypodermoclysis, J. A. M. A. **114**: 1733 (May 4) 1940.

Four patients had severe attacks of the disease with extensive involvement, edema, high fever and toxemia. All improved definitely within twelve to thirty-six hours after the first dose of sulfadiazine. The other 4 had milder attacks which cleared promptly under treatment. Cultures of the blood of all were negative. One Negro patient with severe scarlet fever and leukopenia (1,700 per cubic millimeter), who failed to improve after four days of sulfathiazole treatment, continued to have fever for several days after he was changed to sulfadiazine and then recovered completely.

TABLE 4.—*Duration of Acute Illness in Patients with Pneumonia After Sulfadiazine Treatment Was Started*

Hours from First Dose to Essential Recovery or Death	A		B		C		D		All Pneumonias	
	Recovered	Died	Recovered	Died	Recovered	Died	Recovered	Died	Recovered	Died
12 or less	38	1	3	0	15	1	9	1	65	3
13-24	47	6	9	0	14	1	6	1	76	8
25-36	35	1	4	1	10	1	6	3	55	6
37-48	15	0	2	3	2	0	4	2	23	5
49-72	11	1	0	0	5	0	2	1	18	2
73 or more	13	10	10	3	3	0	5	11	31	24
Totals	159	19	28	7	49	3	32	19	268	48

A, B, C and D refer to groups of patients listed in table 1.

Infections of the Urinary Tract.—There was a striking difference in response between the patients with acute and those with chronic infections of the urinary tract. Among the 17 patients with acute involvement the urinary abnormalities and symptoms cleared completely and cultures became sterile fairly promptly following sulfadiazine treatment. Colon bacillus, alone or with other organisms, was cultured from the urine of most of these patients before treatment, and subsequent urines were sterile. The 12 patients with chronic infections included 3 with Friedländer's bacillus as the predominant organism in the urine (2 of these patients had previously had a nephrectomy), 2 with Flexner dysentery bacilluria and others with a variety of organisms including colon bacilli in cultures of the urine. Only 2 of these 12 patients recovered completely, and both of these had colon bacilli predominantly. Seven others were definitely improved but either had a relapse or continued to have residual symptoms. The patient with Proteus bacillus infection died within thirty-six hours. One other patient died with a complicating diabetic acidosis.

Most of the patients in this group received 6 Gm. daily, but some were given 1 Gm. every six hours during part or all of the course of treatment. Eight of the patients with chronic attacks who failed to show a complete recovery under sulfadiazine had a similar or longer course of sulfathiazole therapy given either before or after the sulfadiazine but with similar lack of success in every instance.

Three of the patients in this group showed abnormal retention of the drug with blood levels above 20 mg. per hundred cubic centimeters (free and acetylated). In none of them was more than one third of the circulating drug found in the conjugated (acetylated) form. One of these 3 patients had a rise in blood nonprotein nitrogen from 54 to 75 mg. per hundred cubic centimeters during the sulfadiazine therapy, but this dropped slowly to 32 mg. per hundred cubic centimeters within a few days. The patient's urine and symptoms, however, improved steadily during chemotherapy.

Gonococcic Arthritis With or Without Urethritis.—The results among patients with these disorders also varied with the chronicity of the disease. Four of the patients had symptoms for less than ten days before sulfadiazine therapy was started, and their disease was classed as acute. All these patients improved rapidly under the treatment. In 1 of them the symptoms recurred one week after discharge from the hospital and shortly after a prostatic massage. Five patients had symptoms for three weeks to several months before admission to the hospital. One of them made a good recovery; the other 4 either failed to improve or improved slowly and then had a relapse of symptoms. Each of these 4 patients also received, either before or after the sulfadiazine, a course of sulfapyridine or sulfathiazole averaging 61 Gm. These drugs likewise failed to bring about a cure.

Meningococcic Infections.—Sulfadiazine was used in the treatment of 2 patients with endemic meningococcic meningitis and 1 with meningococcemia and arthritis (without meningitis). One of the meningitis patients was moribund on admission to the hospital and died within twelve hours. The other 2 patients recovered promptly and completely. During the course of the present study, Dingle and Thomas of this laboratory had an opportunity to treat 11 consecutive cases of epidemic type I meningococcic meningitis in Halifax, N. S. They observed an excellent therapeutic response to sulfadiazine in every instance. The details in all 14 cases are reported separately.[18]

TABLE 5.—*Summary of Results of Sulfadiazine Therapy in Infections Other Than Pneumonia*

Infection	Number of Cases	Died	Evaluation of Therapy * ++	+	±	0	Average Dose, Gm.
Acute infections of upper respiratory tract							
Bronchitis	3	0	1	2	0	0	20
Pharyngitis and tonsillitis	13	0	7	6	0	0	19
Sinusitis	4	0	4	0	0	0	36
Otitis media	2	0	1	0	1	0	26
Clinical influenza	18	0	4	12	2	0	20
Erysipelas (facial)	8	0	4	4	0	0	38
Scarlet fever	1	0	0	0	1	0	105
Pyelonephritis and cystitis							
Acute	17	0	11	5	1	0	27
Chronic	12	2	1	1	7	3	36
Gonococcic arthritis							
Acute	4	0	3	0	1	0	72
Subacute or chronic	5	0	0	1	2	2	87
Meningococcemia with arthritis	1	0	1	0	0	0	54
Meningococcic meningitis	2	1	1	0	1	0	22
Pneumococcic meningitis	4	4	0	0	1	1	49
Subacute bacterial endocarditis	5	4	0	0	1	4	90
Chronic pulmonary infections							
Pulmonary tuberculosis	8	0	0	0	2	6	42
Pleurisy with effusion	3	0	0	0	0	3	32
Nontuberculous (abscess, putrid empyema)	3	0	0	0	1	2	43
Focal staphylococcic infections	2	1	1	0	1	0	29
Intestinal and peritoneal infections	3	1	0	1	0	2	84
Miscellaneous febrile diseases	12	3	0	2	1	9	41
Totals	130	16	39	34	25	32	

* ++ indicates excellent response apparently in relation to sulfadiazine therapy; +, good recovery, relation to sulfadiazine difficult to evaluate; ±, apparent benefit from sulfadiazine with relapse or incomplete recovery; 0, no definite beneficial effect of sulfadiazine discernible.

Pneumococcic Meningitis.—The 4 patients with this disease who were treated with sulfadiazine all had massive infection and bacteremia on admission. One of them died four hours after receiving the first dose of the drug. Two others died after two days of treat-

18. Dingle, J. H.; Thomas, Lewis, and Morton, A. R.: Treatment of Meningococcic Meningitis and Meningococcemia with Sulfadiazine, this issue, p. 2666.

ment with the drug and with intravenous specific serum. In the fourth patient the meningitis occurred as a complication of a fractured skull with extensive brain injury. The blood and spinal fluid were rapidly sterilized following treatment with the drug supplemented with intravenous serum, but the patient died during a relapse of the infection five weeks later. Three of these patients received one or more doses of sodium sulfadiazine parenterally.

TABLE 6.—*Toxic Effects of Sulfadiazine Among Four Hundred and Forty-Six Cases*

Toxic Effect	Number of Cases	Per Cent
Nausea	2	9.2
Vomiting, mild	36	
Vomiting, moderate	3	
Hematuria, gross	1	0.7
Hematuria, microscopic	2	
Increase in blood nonprotein nitrogen	5 *	1.1
Leukopenia (drop below 4,000)	9 †	2.0
Dermititis with or without fever	9	2.2
Drug fever	1	
Headache	2	0.4
Crystals (? acetylsulfadiazine) in urine	35	7.8

* Increases ranged from 15 to 26 mg. per hundred milliliters.
† In 6 of these cases the leukocyte count rose before the drug therapy was discontinued.
Seven cases are listed twice.

Subacute Bacterial Endocarditis.—The results of therapy with sulfadiazine in 5 cases of this disease were uniformly poor. Negative blood cultures were obtained after treatment in only 1 of these cases. In the others the bacteremia persisted in spite of continued therapy. One of the latter patients is still under treatment and the other 4 have died. The organism was Streptococcus viridans in 4 of the cases and enterococcus in the fifth. In 4 cases, all the other common sulfonamides were used in rotation before and after sulfadiazine, an average of 400 Gm. of these drugs being used—all without demonstrable benefit.

Chronic Pulmonary Infections.—Only 3 of the 14 patients in this group showed some improvement under sulfadiazine therapy. This was attributed in each instance to the partial relief of a superimposed acute pulmonary infection. An antipyretic effect such as that noted by Beeson and Janeway [19] in patients treated with sulfapyridine was not observed in any of these patients.

Focal Staphylococcic Infections.—In 1 case an infected hydrocele cleared rapidly after the purulent fluid was tapped and sulfadiazine given orally. Culture of the fluid yielded staphylococci as the predominant organisms and also Friedländer's bacilli. In a second case, a staphylococcic pyarthrosis was improved significantly under treatment. Evidences of infection cleared rapidly, but the joint pain persisted.

Intestinal and Peritoneal Infections.—One patient with known peptic ulcer had low grade fever and suggestive evidence of a subacute perforation. This patient was afebrile and symptom free during two courses of sulfadiazine therapy, but the ulcer symptoms recurred each time after the drug was stopped. A second patient with a gastrocolic fistula obtained no relief and subsequently was operated on and died. The third patient in this group had chronic ulcerative colitis which was not affected by sulfadiazine given orally and in retention enemas. Salmonella suipestifer was identified in repeated stool cultures from this patient.

Miscellaneous Diseases.—In this group are included 4 cases of rheumatic fever, 2 of acute leukemia and 1 each of disseminated lupus erythematosus, S. suipestifer bacteremia (which proved at autopsy to arise from an infected mural thrombus at the site of an old coronary infarct), acute coronary infarction, catarrhal jaundice, infectious mononucleosis and a case of pyrexia of undetermined origin. Definite improvement was noted in only 2 cases: the patient with infectious mononucleosis was afebrile and free of symptoms on the second day of treatment, and one of the patients with acute leukemia showed a definite temporary improvement when a submaxillary abscess cleared under chemotherapy. There was temporary and partial improvement in one case of acute rheumatic fever. The patient who was treated for fever of undetermined origin was the only one of the 446 patients in whom severe renal symptoms (colic and hematuria) developed. This occurred after two and one-half weeks of continued therapy with full doses.

TOXIC EFFECTS

Toxic symptoms referable to sulfadiazine therapy were comparatively rare and mild. They were noted in 63, or 14.1 per cent, of the 446 patients, excluding those in whom crystals were found in the urine without other abnormalities or symptoms (tables 6 and 7).

Nausea and Vomiting.—During sulfadiazine administration nausea and vomiting were noted in 9.2 per cent of the patients, including those in whom this symptom was present before the drug was started. In no instance was this symptom severe. On the other hand, many patients who had been vomiting prior to the sulfadiazine therapy, either as part of their illness or as a result of therapy with other drugs, tolerated the sulfadiazine well.

In the Urinary Tract.—Crystals, probably acetylsulfadiazine, were noted in the urine during therapy in 35 patients. These were most frequently of the "sheaves of wheat" type and closely resembled the crystals of acetylsulfathiazole.[20] There were no other urinary abnormalities except in the 3 patients with hematuria. In 2 of the latter a few red blood cells were noted in the urine in the course of therapy, but subsequent specimens of urine taken while the drug was continued were free of blood. In 1 patient ureteral colic and gross hematuria developed followed by anuria on the seventeenth day of therapy. This was promptly relieved by catheterization of the ureters and pelvic lavage. The concentration of sulfadiazine in the blood at the time was 19.8 mg. per hundred cubic centimeters, of which 1.5 mg. was the acetyl derivative. The first urine voided after the catheterization con-

TABLE 7.—*Comparative Toxicity of Sulfadiazine and Sulfathiazole in Cases in Which Both Drugs Were Given*

Toxic Effect from	Number of Cases
Sulfadiazine only	9
Sulfathiazole and sulfadiazine	11
Sulfathiazole only	28
Neither drug	25
Number treated with both drugs	68

19. Beeson, P. B., and Janeway, C. A.: The Antipyretic Action of Sulfapyridine, Am. J. M. Sc. **200**:632 (Nov.) 1940.

20. Sunderman, F. W., and Pepper, D. S.: Sulfathiazole in Blood and Urine, Am. J. M. Sc. **200**:790 (Dec.) 1940.

tained 271 mg. per hundred cubic centimeters of sulfadiazine, of which 150 mg. was of the acetyl derivative.

Five patients showed a significant rise in nonprotein nitrogen during sulfadiazine therapy. The concentration of sulfadiazine in the blood of 1 of these patients who was treated for pneumonia rose and reached a level of 44 mg. per hundred cubic centimeters, of which 26 mg. was of the acetyl derivatives. This was the highest percentage of acetylation of sulfadiazine in the blood noted in this study but the patient had no untoward symptoms. There were 16 other patients with elevated levels of nonprotein nitrogen (ranging from 43 to 91 mg. per hundred cubic centimeters of blood) before sulfadiazine therapy was started whose levels dropped 20 to 41 mg. per hundred cubic centimeters during the course of drug therapy.

Leukopenia.—Drops in the leukocyte count from high or normal to below 4,000 per cubic millimeter were noted in 9 cases. There was a proportionate drop in the granulocytes. In 6 of the cases the drop occurred during the first four days and the leukocyte count rose again while the drug therapy was continued. In the other 3 the low counts were noted between the eleventh and the sixteenth day of therapy, and the lowest count was 2,000 per cubic millimeter. In these cases the drug was stopped and the leukocyte count promptly rose.

There were 8 other patients with initial leukocyte counts below 4,000 before treatment whose counts rose during therapy. One of these had severe alcoholic pneumonia, with bacteremia and infected pleural fluid. His leukocyte count before treatment was 500 per cubic millimeter. This rose gradually under sulfadiazine and serum therapy, and the patient made a complete recovery.

Dermatitis and Fever.—Only 1 patient had fever as the only symptom that could be attributed definitely to the drug. A rash was noted on 9 patients. This was morbilliform in each instance, except in 1 patient whose rash was of the "erythema nodosum" type, resembling those often seen in sulfathiazole treated cases. The rash appeared on the fourth day of treatment on 1 patient and after eight to fourteen days of sulfadiazine therapy on the others. In each instance the rash cleared promptly when the drug was stopped. In another patient, readministration of the drug one week later resulted in a recurrence of the rash after twenty-four hours.

Miscellaneous.—Headache and slight dizziness were noted during treatment of 2 patients and were relieved when the drug was stopped. Anemia, either of the acute or of the slowly progressive type, resulting from chemotherapy, was not observed in any of these patients. Jaundice did not develop in any patient under treatment. Three patients with clinical and laboratory evidence of impaired hepatic function were treated with full doses of sulfadiazine. In 2 of these patients the hepatic function improved and in the other it remained unchanged during treatment.

Comparison with Sulfathiazole (table 7).—Each of 66 patients received a separate course of both sulfathiazole and sulfadiazine. This offered an opportunity for the comparison of the toxic effects of the two drugs in the same patients. Some toxic symptoms, mostly nausea, vomiting, hematuria and dermatitis, were noted in 39 patients while they were receiving sulfathiazole, but only 13 had any untoward effects from sulfadiazine. Twenty-eight patients had symptoms from sulfathiazole and not from sulfadiazine, while the reverse was true in only 2 patients.

SUMMARY AND CONCLUSIONS

Sulfadiazine was used in the treatment of 446 patients with various infections. It appeared to be highly effective in the treatment of the following diseases: pneumococcic, staphylococcic and streptococcic pneumonias; meningococcic infections; acute infections of the upper respiratory tract including sinusitis; erysipelas; acute infections of the urinary tract, particularly those associated with Escherichia coli bacilluria, and acute gonorrheal arthritis.

No well defined beneficial effects were noted from its use in the treatment of chronic infections of the urinary tract, chronic gonococcic arthritis, subacute bacterial endocarditis or chronic pulmonary infections. However, in all patients with these conditions in whom sulfadiazine therapy was not effective and in whom other sulfonamides were tried, the latter were likewise ineffective.

The results in the cases of pneumococcic pneumonia treated with sulfadiazine are comparable in every respect with the best results obtained in this clinic with the use of either sulfapyridine or sulfathiazole. In all the other conditions the numbers of cases are too few to warrant definite conclusions or comparisons. In general, sulfadiazine appeared to be as effective as sulfapyridine or sulfathiazole in every condition in which it was used.

Toxic effects from sulfadiazine were relatively mild and infrequent. Nausea and vomiting occurred in 9.2 per cent of the cases. Nitrogen retention of moderate degree was noted in 5 cases. Leukopenia occurred early and was transient in some cases. In 3 cases the leukocyte counts dropped between the eleventh and the sixteenth day and returned to normal on cessation of therapy. Morbilliform eruptions were observed in 9 cases and usually appeared on the eighth day or later. In 1 case renal colic, hematuria and anuria were relieved by ureteral catheterization.

A number of patients with definite evidence of renal or hepatic damage were treated with sulfadiazine without further impairment and, in some instances, with actual improvement of function in the course of therapy. Some patients with initial leukopenia showed a rise in the white blood count during sulfadiazine therapy.

Sixty-six patients received both sulfathiazole and sulfadiazine, and toxic effects from sulfathiazole were three times as frequent as they were during sulfadiazine therapy.

Sodium sulfadiazine in physiologic solution of sodium chloride was used for the initial dose in some of the most severe cases. No untoward local or systemic effects were noted from its administration in concentrations of 1 to 5 per cent of the drug intravenously or 0.5 per cent subcutaneously.

The Discoveries of Claude Bernard.—Claude Bernard (1813-1878), the great physiologist, made at least three important discoveries: (1) the digestive action of the pancreatic juice; (2) the glycogenic function of the liver; and (3) the discovery of the vasomotor nerves, which is his outstanding contribution to psychiatry. Since the vasomotor fibers are distributed through all tissues of the organism and are involved in reflex control, researches on the action of various chemical substances, peripheral resistance, blood pressure phenomena, reflex equilibrium, organic animal life and environment and the effect of emotions upon the organism, as well as many other types of investigation, have been made possible.—Lewis, Nolan D. C.: A Short History of Psychiatric Achievement, New York, W. W. Norton & Co., Inc., 1941.

AN ACUTE MEDIASTINOCARDIAC REACTION FOLLOWING IRRADIATION IN HYPERTHYROIDISM

REPORT OF THREE CASES

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Within the past three years we have encountered 3 patients with thyrotoxicosis in whom a clinical picture strongly suggesting an acute noninfectious mediastinocardiac reaction appeared during or shortly after irradiation of the thyroid gland and upper mediastinum. The clinical picture was characterized by acute severe precordial and retrosternal pain aggravated by thoracic movement, electrocardiographic changes of the type associated with acute pericarditis, fever, the absence of significant physical signs and of preceding infection and uncomplicated recovery within a few days. In view of the striking character of this reaction and because of our inability to find a description of a similar clinical picture in the literature, a report of our cases seems desirable.

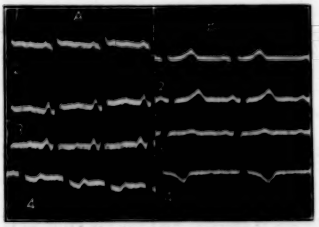

Fig. 1 (case 1).—*A*, tracing made July 6, 1937 shows deflection of the RS-T segment, most noticeable in lead 2, and deformity of the T wave. *B*, tracing made May 15, 1939 is entirely normal except for occasional auricular extrasystoles (not shown here) and left axis deviation. In both *A* and *B* lead 4 was made with the electrode of the right arm over the apex and paired with the left leg.

REPORT OF CASES

CASE 1.—Mrs. E. W., aged 33, began to notice fatigue, nervousness and loss of weight soon after the removal of tonsillar remnants in June 1936. When she was first seen on June 25, 1937 there had been a loss of 25 pounds (11 Kg.). Examination revealed slight prominence of the eyes with conjunctival injection, tachycardia, tremor, a widened pulse pressure and a moderate, diffuse, somewhat firm enlargement of the thyroid gland. Her blood pressure was 140 systolic and 50 diastolic, the cardiac rhythm was normal and there was a soft blowing apical systolic murmur. She had had two operations to remove the tonsils in an effort to relieve deafness, but there was no past history of acute tonsillitis, quinsy, chorea or rheumatic fever. The basal metabolic rate was + 47 per cent. A diagnosis of toxic diffuse goiter was made and irradiation was begun June 29.

Irradiation was given to the thyroid gland on June 29 and 30 and July 1 and 2. This included 204 roentgens delivered anteriorly to the neck through a rectangular portal 10 by 16 cm., the lower portion of which included the upper mediastinum. Four hundred and ten roentgens was delivered posteriorly through a rectangular portal 10 by 16 cm. No iodine was given at any time.

On July 2 the patient felt a little chilly, and about midnight she was awakened by a severe retrosternal pain which penetrated through the middle of her chest to the interscapular area. This pain was aggravated by deep breathing, and she was unable to lie down but felt as though she had to sit erect and keep her thorax immobile. There was no radiation of the pain to either shoulder or to the arms. The symptoms continued with increasing severity until she was seen about 1:30 p. m. July 3. At this time her temperature was 100 F., the pulse rate 88 with normal rhythm and the blood pressure 115 systolic and 70 diastolic. Respiration was shallow, uneasy and accompanied by slight grunting. Examination of the heart revealed only slight tachycardia and the apical systolic murmur previously noted; examination of the lungs showed only diminished aeration throughout. Nothing suggestive of pericardial or pleural friction could be heard. The patient was given ¼ grain (0.016 Gm.) of morphine sulfate and was immediately transferred to the hospital.

The leukocyte count on admission showed 14,800 cells per cubic millimeter, with 91 per cent neutrophils, 5 per cent lymphocytes and 4 per cent monocytes. Her temperature was 101.1 F. on admission. The following day the pain was much better. The temperature had returned to normal and the leukocyte count had dropped to 5,150 per cubic millimeter. There were still no abnormal pulmonary signs, but auricular fibrillation was present with a rapid ventricular rate. Administration of quinidine sulfate was begun, 0.2 Gm. every four hours. On July 5 the cardiac rhythm had reverted to normal, and the patient's symptoms had practically disappeared except for slight retrosternal pain on yawning. The administration of quinidine sulfate was stopped.

An electrocardiogram on July 6 showed changes of the sort sometimes found in acute pericarditis with T waves of low amplitude and deflection of the RS-T segment (fig. 1 *A*). The patient's symptoms had entirely disappeared by this date. On July 8 she received a final dose of radiation consisting of 205 roentgens delivered anteriorly through the same portal previously employed. Unfortunately at this time the relationship between the irradiation and the patient's acute thoracic symptoms was not appreciated. This fact, together with her economic limitations, explains why more complete and detailed studies were not made at the time. The thyrotoxicosis continued to improve steadily with a progressive gain in weight and subsidence of the goiter. No more irradiation was given. On October 12, the basal metabolic rate was — 9 per cent and on Feb. 3, 1940 it was + 3 per cent. An electrocardiogram made May 15, 1939 showed occasional auricular extrasystoles and left axis deviation but was otherwise normal (fig. 1 *B*). Periodic physical examination of the heart since that date has revealed nothing of significance, and the patient is now entirely well except for chronic deafness and nasal allergy.

CASE 2.—Mrs. L. W., aged 30, was seen in consultation with Dr. I. S. Ravdin, who has given us permission to report her case.

In October 1937 signs and symptoms of thyrotoxicosis first appeared, the basal metabolic rate at that time being + 45 per cent. After prolonged rest and sedation, there was gradual improvement, and in March 1938 the basal metabolic rate was + 7 per cent. On November 29 the basal metabolic rate was + 18 per cent. In January 1939 thyrotoxic symptoms again became manifest, and irradiation of the thyroid gland was begun February 1. This therapy was repeated on February 2, 3, 27 and 28 and on March 1, 2, 28, 29 and 30. A total of 919 roentgens was given through each of two skin portals 10 by 15 cm. over the right and left anterior portion of the neck, and a total of 744 roentgens was given through each of two skin portals of the same dimensions over the right and left portions of the neck posteriorly. The total dose of radiation received, therefore, was 3,326 roentgens. During the last series of treatments on March 28, 29 and 30, the total dose received anteriorly was 526 roentgens and the total posterior dose was also 526 roentgens. On March 13 the basal metabolic rate was + 36 per cent.

Early in March the patient became pregnant, and during the next few weeks her symptoms were considerably aggravated. She received no iodine but was given sedatives and kept at rest much of the time. On April 2, while at rest in bed, the patient was suddenly seized by a sharp precordial pain which radiated

From the Endocrine and Cardiovascular Sections of the Medical Clinic and the Robinette Foundation, Hospital of the University of Pennsylvania.

toward the lower left axilla and through the middle and upper retrosternal regions. This pain was made worse by respiration or other movement of the thorax and continued with little respite until her admission to the hospital on April 3.

At the time of admission, her temperature was 100 F., blood pressure 120 systolic and 60 diastolic, pulse rate 120 and respiratory rate 24. The leukocytes numbered 9,300 per cubic millimeter with 86 per cent neutrophils. The patient was nervous and apprehensive, and respiration was apparently painful. There was slight exophthalmos and a diffuse, moderate, soft enlargement of the thyroid. The lungs were essentially normal on examination, and the heart showed only tachycardia with a normal rhythm; no pleural or pericardial friction rub could be heard. An electrocardiogram made soon after admission showed a pattern suggesting acute pericarditis with elevation of the RS-T segment in leads 1 and 2 (fig. 2 *A*). The following day, the pain had decreased considerably and the fever had subsided. One examiner thought that a definite friction rub was audible in the lower left part of the left axilla. An electrocardiogram made on this date showed auricular extrasystoles and deformities of the T wave in various leads (fig. 2 *B*). The deflection of the RS-T segment was less noticeable than in the first tracing. Roentgen examination of the chest on April 5 gave negative results. The pain had practically disappeared by this time and did not recur. Electrocardiograms made April 10 and 18 showed a progressive return toward normal (fig. 2 *C* and *D*). The basal metabolic rate on April 19 was + 23 per cent.

The patient left the hospital April 21 with no cardiac or pulmonary signs or symptoms although still presenting a picture of moderate thyrotoxicosis. Further irradiation to the thyroid gland was given in May and June 1939 without any untoward reaction. An electrocardiogram made May 17 showed simple tachycardia but was otherwise normal (fig. 2 *E*). The patient remained moderately thyrotoxic throughout the summer and was kept at rest a large part of the time. An electrocardiogram made October 7 showed simple tachycardia but was otherwise normal. By November the thyrotoxicosis had greatly abated and the patient was uneventfully delivered of a normal child December 11. Except for occasional nervousness she has remained well since.

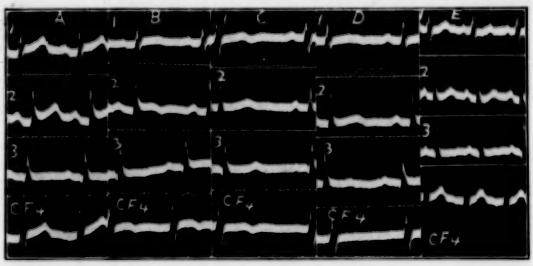

Fig. 2 (case 2).—*A*, tracing made April 3, 1939 shows deflection of the RS-T segment most noticeable in lead 2. *B*, tracing made April 4 shows an occasional auricular extrasystole (first beat in lead 2), less deflection of the RS-T segment and beginning deformity of the T wave. *C*, made April 10, and *D*, made April 18, still show some deformity of the T wave. *E*, which was made May 17, is entirely normal except for tachycardia. Subsequent tracings were also normal.

CASE 3.—M. N., a man aged 46, had had pleurisy with effusion at the age of 16. His symptoms disappeared after thoracentesis. A few years later he was told that he had a "spot" in his lungs and was sent away to rest for several months. No roentgenograms were taken at that time. He remained well thereafter until 1927, at which time he had thyrotoxicosis, and a thyroidectomy was done in Richmond, Va. In 1930 his thyrotoxic symptoms recurred, and a second thyroidectomy was performed in New York. In 1932 thyrotoxic symptoms again recurred, and he began the use of iodine, which was continued intermittently until April 1940. In 1934 he received a short course of irradiation to the thyroid region with temporary amelioration of his symptoms. On March 19, 1940, he suffered a short attack of grip with fever, generalized aching and malaise. Gradual recurrent enlargement of the thyroid gland had been noted for some months together with recurrent thyrotoxic symptoms. Accordingly, irradiation of the thyroid gland was again begun in the private office of a Philadelphia roentgenologist. Treatment was given on March 23, 27, 29 and 30 and April 1 and 3. Treatment was given through a lateral portal on each side of the neck and a median portal which included the upper sternal region. The dose received through each portal was 198 roentgens. It should be noted that the patient was taking 10 drops of tincture of iodine regularly each day from March 19 to April 9. A mild diarrhea began about April 5.

On April 6, while stoking his furnace, the patient suddenly felt dizzy and fainted. On recovery he noted a sharp precordial pain which lasted for several minutes but did not radiate. It seemed to be aggravated by respiration or any other movement of the thorax. This sharp pain continued to recur at irregular intervals but with somewhat decreasing frequency and was accompanied by a duller, more constant, nonradiating retrosternal pain which likewise was made worse by movement of the thorax. The patient was attended by his family physician and on April 9 was admitted to the medical service of Dr. O. H. P. Pepper at the Hospital of the University of Pennsylvania.

It seems certain that the patient received digitalis, but the amount and duration of such therapy is not clear. He stated that he received a large amount of digitalis during the day after the onset of symptoms, but according to another statement he had been taking 4 drops of tincture of digitalis daily for about a month prior to his admission to the hospital.

On admission, he appeared acutely and severely ill. The temperature was 101 F., the radial pulse rate 88, the respiratory rate 22 and the blood pressure 130 systolic and 70 diastolic. There was moderate exophthalmos and a diffuse, noticeable firm enlargement of the thyroid gland, the left lobe being decidedly tender. There was slight cyanosis of the nail beds and advanced erythema of the neck and the upper part of the chest. The pharynx and tonsils were acutely congested. Respiration obviously caused discomfort, and the patient attempted to keep his thorax immobile. Examination of the lungs was negative except for a few crackling rales at the bases of both. The cardiac rhythm was totally irregular (auricular fibrillation). The ventricular rate was rapid, and a systolic murmur was audible at the apex and at the base. In addition, an adventitious sound was heard over the base of the heart which was variously interpreted by different examiners. It was harsh and loud during systole, but there was a difference of opinion regarding its diastolic audibility. (The majority of observers felt that this was not a true pericardial friction rub, and this belief was supported later by the fact that the sound persisted long after the patient's pain and other acute symptoms had subsided. It probably represented a type of adventitious sound frequently heard over the cardiac base in persons with thyrotoxicosis, the mechanism of the production of which is not yet clear.)

The hemoglobin content was 69 per cent and the leukocytes numbered 8,500 per cubic millimeter, with neutrophils 65 per cent, lymphocytes 20 per cent, monocytes 7 per cent and eosinophils 8 per cent. Subsequent blood cell counts taken at short intervals during the patient's stay in the hospital showed moderate anemia with leukocyte counts ranging from 4,800 to 6,900 per cubic millimeter. Except for the 8 per cent eosinophils found on admission, the eosinophilic percentage of his leukocyts did not exceed 4.

An electrocardiogram was made on the day of admission (fig. 3 *A*). This showed auricular fibrillation, ventricular extrasystoles, slight prolongation of the QRS complex and diphasic T waves in lead 1. A tracing made April 18, after no digitalis had been taken for nine days, showed a normal rhythm, a PR interval of 0.2 second and disappearance of the intraventricular conduction defect which had been present in the previous tracing

(fig. 3*B*). The T waves were practically flat in lead 1 and somewhat deformed in the chest leads. However, a comparison of the T waves with those of the first tracing could not be made because of the digitalis and because the defect in intraventricular conduction may also have influenced the T waves in the first tracing. A tracing made April 27 showed a PR interval of 0.16 second. At this time there was slight inversion of the T waves in leads 1 and 2 and in the chest leads CF_4 and CF_5 (fig. 3*C*). The shortening of the PR interval suggested that there may still have been some effects of digitalis on April 9, when the PR interval was 0.2 second. A tracing made May 8 showed flattening of the T waves in lead 1 and lead 2 and small diphasic T waves in the chest leads CF_4 and CF_5, indicating a change toward normal (fig. 3*D*). A tracing made June 1 was entirely within normal limits. The tracings obtained from April 18 until June 1 show a series of changes entirely consistent with a diagnosis of pericarditis rather than myocardial infarction. This view is based on (1) the absence of any of the types of change in the QRS complexes to be expected in myocardial infarction, (2) the pattern of inversion of the T wave and (3) the rapidity of reversion to normal. Digitalis can be ruled out as a cause of these changes even though a large dosage of the drug may have been taken prior to April 9. The period seemed entirely too long for the changes to be accounted for solely by digitalis.

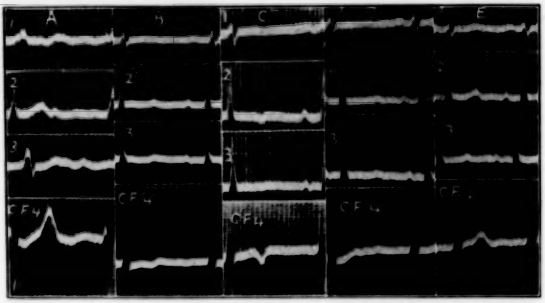

Fig. 3 (case 3).—*A*, tracing made April 9, 1940 shows auricular fibrillation, a slight defect in intraventricular conduction (present in most beats) and deformity of the T wave in the beats of lead 1 which show the defect in intraventricular conduction. Ventricular extrasystoles were also present but are not shown here. *B*, tracing made April 18 shows a top normal PR interval (0.2 second) and deformity of the T wave. *C*, tracing made April 27 shows a PR interval of 0.16 second but greater deformity of the T wave. *D*, tracing made May 8 shows lessening of the deformity. *E*, tracing made June 1 is within normal limits and is similar to one made three months later.

On April 11, the attacks of precordial pain were much less frequent and the interval pain had almost disappeared. A maculopapular eruption was noted on the wrists and forearms, and during the next few days this extended to the legs and the upper part of the chest, becoming partly vesicular and later hemorrhagic. Multiple arthralgia first appeared on April 11 and continued to be annoying for about five days. On April 12 the patient complained of stiffness of the neck with pain on motion of the head or neck. Rather profuse epistaxis also occurred that day. The following day diffuse tracheobronchitis was noted, but for the first time the cardiac rhythm was observed to have reverted to normal and remained normal thereafter. The patient's temperature was still elevated but had shown a downward trend since admission. A mild, irregular fever persisted until April 28, after which there was only an occasional isolated slight rise in temperature. On April 14, because of continued stiffness of the neck as well as some mental confusion and the presence of a positive Kernig reflex, a lumbar puncture was performed. The spinal fluid showed pellicle formation and a slight increase in protein content. During the next few days, the mental confusion and the signs of meningeal irritation disappeared rapidly, and a lumbar puncture performed April 22 revealed normal spinal fluid. On April 22 the basal metabolic rate was + 25 per cent, and on May 3 it was + 35 per cent. At this time the patient was definitely improved although still obviously thyrotoxic.

Despite the probability that iodism had accounted for at least part of his original clinical picture, it was felt that the resumption of small doses of iodine was justifiable in an attempt to prepare him for subtotal thyroidectomy, especially in view of the fact that he had received no iodine since his admission to the hospital. Accordingly, he was given 3 minims (0.18 cc.) daily of a saturated solution of potassium iodide on May 3, and on May 9 a maximal subtotal thyroidectomy was performed by Dr. E. L. Eliason. Postoperative convalescence was uneventful, and the patient was discharged May 19. He was last seen June 1, at which time he was entirely symptom free. Cardiac examination on this date showed normal rhythm and a faint apical systolic murmur. The adventitious sound previously heard over the cardiac base was not audible.

Case 3 has been reported in some detail because of its complexity and the bizarre clinical picture, which caused a number of diagnoses to be considered when the patient was first seen. Eventually it seemed clear that the whole picture could best be explained by the occurrence of acute iodism in a patient with thyrotoxicosis, complicated by an acute mediastinocardiac reaction following closely on irradiation of the thyroid region and the upper mediastinum. The occurrence of iodism in thyrotoxic persons has recently been well described by Barker and Wood.[1] All of our patients phenomena are included among the observations on their cases with the exception of the thoracic pain, the electrocardiographic records and the meningeal signs.

In considering the diagnosis of iodism in case 3 the fact must be recalled that the patient had taken iodine intermittently since 1932 with impunity. Three, and probably 4, of Barker and Wood's patients[1] likewise had previously taken iodine without a reaction. Dr. O. H. P. Pepper suggested that the systemic manifestations of iodism might have followed the liberation of iodine from the thyroid and mediastinal tissues as a result of their exposure to radiation and that the presence of iodine in these structures might in some way have facilitated the acute mediastinocardiac reaction which followed irradiation. Such a hypothesis, however, is not susceptible of proof at this time. Our patient did not remember whether he had been taking iodine during his course of irradiation in 1934.

COMMENT

The principal clinical features of all 3 cases are strikingly similar except for the complicating factors in case 3, which were probably the result of iodism. The retrosternal and midthoracic reference of pain, as well as its striking aggravation by thoracic movement in all 3 cases, strongly suggests some type of inflammatory process involving the mediastinal pleura or the areolar tissue and the other contents of the mediastinum. The absence of any true friction rub (except the transitory rub noted in case 2 in the lower part of the left axilla by one observer) and the absence of any definite indications in the roentgenograms of the chest taken in

1. Barker, W. H., and Wood, W. B., Jr.: Severe Febrile Iodism During Treatment of Hyperthyroidism, J. A. M. A. **114**:1029 (March 23) 1940.

cases 2 and 3 by no means exclude such an inflammatory process. It is noteworthy that in no case was there any history of rheumatic infection or of any other acute infectious process immediately preceding the onset of symptoms, except the grip, which preceded by eighteen days the onset of symptoms in case 3. In view of this fact, as well as the brief duration of symptoms and the complete absence of any permanent sequelae in all the cases, an infectious cause of the reaction seems highly unlikely. Likewise, so far as we are aware, acute spontaneous reactions of this type occurring in the course of hyperthyroidism have never been reported. The possibility of some other acute cardiac episode producing similar symptoms (for example, myocardial infarction) seems to be excluded by the electrocardiographic record.

It is difficult to determine the exact nature of the cardiac disturbance which produced the electrocardiographic changes in our cases. The pericardium itself was not exposed to irradiation. It would not be difficult to assume that an inflammatory process due to infection might extend directly from the mediastinal contents or pleurae to the pericardium and to the underlying myocardium (which must be responsible for the electrocardiographic changes in acute pericarditis), but such an assumption is not so easy in the absence of infection. Electrocardiographic changes do occur in uncomplicated hyperthyroidism,[2] but the abnormalities reported here were not of this type. Furthermore, in case 2 they disappeared long before the thyrotoxicosis, and in case 3 there had been definite change toward a normal pattern prior to operative relief of the hyperthyroidism. It is conceivable, but unlikely, that temporary myocardial change resulting from the absorption of toxic inflammatory products in the mediastinum may have produced the electrocardiographic changes. The pattern, however, is most suggestive of acute pericarditis with underlying myocardial involvement, and the absence of definite pericardial friction rub or effusion does not by any means exclude this possibility.

The occurrence of undoubted acute infectious mediastinitis with transitory electrocardiographic changes of the type associated with pericarditis is illustrated by the following episode:

> A physician aged 40 had acute severe retrosternal pain extending down both arms and accompanied by fever five days after a fish bone penetrated the pharyngeal wall. An electrocardiogram made about twelve hours after the onset showed deflections of the RS-T segment suggesting an acute pericarditis. Physical examination of the heart and lungs gave negative results. The thoracic pain completely disappeared within a few hours after incision and drainage of a retropharyngeal abscess, and the electrocardiographic pattern reverted toward normal during the next four days.

There could be little doubt that acute mediastinitis with extension to at least outer layers of the myocardium had followed the retropharyngeal infection.

Acute and chronic inflammatory reactions following irradiation in various organs have been extensively studied.[3] Changes occurring in the bronchi, lungs and pleura have been particularly well described by Desjardins [4] and more recently by Warren and Spencer.[5] Pericardial and myocardial reactions following direct exposure of these structures to large doses of radiation have been observed in experimental animals by Warthin and Pohle [6] and by Hartman.[7] Desjardins [4] reported extensive structural changes in the human myocardium and pericardium following irradiation of the breast, thorax and lungs. Acute tracheobronchitis, pharyngoesophagitis and acute or subacute pneumonitis are well recognized reactions to radiation in therapeutic dosage. It seems entirely reasonable, therefore, that an acute sterile inflammatory reaction of the mediastinal pleurae or the mediastinal contents might have followed irradiation in our cases. The possibility must be considered that the retrosternal pain, the fever and the electrocardiographic changes were due merely to simple acute pericarditis which occurred by chance just at the time of irradiation. If the sequence of events had occurred in only 1 case, this possibility could not be excluded. However, the time relations of the events in 3 cases, 2 of which came under our observation within a single year, would appear to make such an assumption improbable.

The only report in the literature which we have been able to find of a reaction resembling that in our cases is of a patient described by Strasser [8] in 1912 in whom acute anginoid pain accompanied by fever and a pleural friction rub occurred during intensive irradiation of a mediastinal tumor. No electrocardiogram was mentioned in the report.

It is of interest that in both the clinical and the experimental reports inflammatory reactions in nearly all instances were preceded by much larger doses of radiation than our patients received. Thus of 16 patients cited by Warren and Spencer [5] with definite pulmonary reactions (immediate and late) to irradiation only 1 patient had less than 1,000 roentgens and only 3 had less than 3,000. By contrast, the acute reaction in our case 1 developed after only 204 roentgens had been given anteriorly and 410 posteriorly. In case 2, 1,312 roentgens anteriorly and 962 posteriorly had been given with apparent impunity prior to the series immediately preceding the acute reaction, and in case 3 an unknown amount of radiation had been given about six years previously without untoward effect. Warren and Spencer [5] stated: "The amount of radiation necessary to produce histologic reaction varies greatly, although in most instances heavy dosage is required. This, together with variations in time and rate at which treatment is given, and the size of portal, suggests that there are factors other than irradiation alone concerned . . ."

SUMMARY

The acute reaction occurring in 3 patients with thyrotoxicosis during or shortly after irradiation of the thyroid area and upper mediastinum was similar in all three cases. Its principal features included the acute onset of precordial and retrosternal pain aggravated by thoracic movement and accompanied by fever, leukocytosis (in 2 cases), transitory auricular fibrillation

2. Rose, Edward; Wood, F. C., and Margolies, Alexander: The Heart in Thyroid Disease: II. The Effect of Thyroidectomy on the Electrocardiogram, J. Clin. Investigation **12**: 497 (July) 1933.

3. Groover, T. A.; Christie, A. C., and Merritt, E. A.: Observations on the Use of Copper Filter in Roentgen Treatment of Deep-Seated Malignancies, South. M. J. **15**: 440 (June) 1922. Hsieh, C. K., and Kimm, H. T.: Changes in Lungs and Pleura Following Irradiation for Extrathoracic Tumors, Am. J. Roentgenol. **37**: 802 (June) 1937. Hartman, Bolliger, Doub and Smith.[7] Warthin and Pohle.[6] Desjardins.[4] Warren and Spencer.[5]

4. Desjardins, A. U.: Action of Roentgen Rays and Radium on the Heart and Lungs, Am. J. Roentgenol. **28**: 699 (Nov.) 1932.

5. Warren, Shields, and Spencer, Jack: Radiation Reaction in the Lung, Am. J. Roentgenol. **43**: 682 (May) 1940.

6. Warthin, A. S., and Pohle, E. A.: Effect of Roentgen Rays on the Heart, Arch. Int. Med. **43**: 15 (Jan.) 1929.

7. Hartman, F. W.; Bolliger, Adolph; Doub, H. P., and Smith, F. J.: Heart Lesions Produced by Deep X-Ray, Bull. Johns Hopkins Hosp. **41**: 36 (July) 1927.

8. Strasser, cited by Desjardins.[4]

(in 2 cases) and electrocardiographic changes of the type associated with acute pericarditis. Significant physical signs were absent or questionable. The acute phenomena subsided in a few days, leaving no permanent sequelae. One case was complicated by probable acute iodism.

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ADVANTAGES OF PROTAMINE ZINC INSULIN

RESULTS IN DIABETES COMPLICATED BY TUBERCULOSIS

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When diabetes and tuberculosis coexist, the tuberculosis nearly always follows on the diabetes, thus making it evident that diabetes predisposes to tuberculosis.[1] The onset of tuberculosis in persons with diabetes is hastened and favored if the diabetes is not properly managed, and it is believed that persons with controlled diabetes are no more liable to have pulmonary tuberculosis than nondiabetic subjects.

The successful treatment of tuberculosis in the diabetic patient is impossible without regulation of the diabetes. We have witnessed the doom of many persons with tuberculosis and diabetes, especially in preinsulin days, when they entered sanatoriums that specialized in the treatment of tuberculosis but scoffed at the necessity for any attention to the diabetes. The satisfactory adjustment of the diabetes makes it possible to achieve the same results with the tuberculosis in the diabetic as in the nondiabetic patient.[1] Since the utmost results for the cure of pulmonary tuberculosis appear to be achieved when the diabetes is well controlled, it seemed worth while to check on the comparative effects of protamine zinc insulin and regular insulin on the clinical course of tuberculosis when it was complicated by diabetes.

The term control of diabetes is usually employed as though it had a set meaning and that its criteria were fixed. The generally accepted conception of what makes the ideal regulation of diabetes is based largely on the existing ingrained deference to normality, that is, averages in persons who are regarded as healthy. The pattern for control of diabetes that has been conventionally set up until recently has been absence of sugar in the urine, freedom from acidosis, a normal level of blood sugar and a moderate degree of underweight. The perfect standard of control for diabetes is necessarily in a state of flux depending on the facts that are brought to light from time to time by laboratory research on carbohydrate metabolism and by clinical observation of patients with diabetes.

The first tradition to be set aside was the acknowledgment that an elevation of blood sugar in the absence of glycosuria is not only harmless but even beneficial, because hyperglycemia promotes the utilization of sugar, does not predispose to infections, does not cause degenerative changes in the tissues and in fact is the rule in elderly (nondiabetic) human beings.[2] The confessed necessity for obtaining a twenty-four hour blood sugar curve to be certain that dextrose persists in the blood within a normal range makes it obvious that any physician who claims that the blood sugar is maintained within conventional accord because the blood sugar in a fasting patient is at a satisfactory level is fooling not only himself but all his patients and co-workers.

Numerous clinical observations have been made that small amounts of sugar in the urine while a patient is under the influence of protamine zinc insulin does no harm. This is a direct contradiction of what was believed to hold true when regular insulin was the only insulin available. Wilder [3] has offered an explanation of this paradox by demonstrating that in cases of severe diabetes intermittent periods of destruction of protein and loss of nitrogen occur when regular insulin is injected at the customary intervals throughout the day, whereas tissue loss ceases with the employment of protamine zinc insulin, which is effective for more than twenty-four hours and thus results in constant abatement of some, at least, of the inroads entailed by the uncurbed metabolic disturbance of diabetes. Tolstoi [4] has advanced further along these lines by showing that even great degrees of glycosuria are not accompanied by loss of nitrogen and, for a period of one year at least, diabetic patients under the influence of protamine zinc insulin have not been adversely affected in any way by such losses of sugar in the urine.

Whether or not glycosuria, of slight or of great degree, is innocuous when persisting over a period of years is something we cannot be certain about for some time to come. Most physicians feel more satisfied with the results of treatment and more secure about the condition of their patients when the urine contains little or no sugar. On the other hand, if hypoglycemic reactions, which often entail considerable temporary and at times permanent impairments, can be avoided by the feeding of extra amounts of carbohydrates, especially at night and before exercise, the risks of glycosuria are decidedly less than the hazards of hypoglycemia.

It is the general impression (one can go no further than that), which we share, that ketonuria, diabetic coma and gangrene and infection of the lower extremities occur less frequently since protamine zinc insulin has become generally used.

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1. References include:
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Himsworth, H. P.: Pulmonary Tuberculosis Complicating Diabetes Mellitus, Quart. J. Med. **7:** 373 (July) 1938.
King, S. E.: Treatment of Diabetes Complicated by Tuberculosis, M. Clin. North America **20:** 829 (Nov.) 1936; Incidence of Pulmonary Tuberculosis in Diabetes, Quart. Bull. Sea View Hosp. **1:** 416 (July) 1936.
Myers, G. B., and McKean, R. M.: Diabetes and Tuberculosis, Am. Rev. Tuberc. **34:** 219 (Aug.) 1936.
Rost, H. F.: The Association of Diabetes and Tuberculosis, New England J. Med. **210:** 1 (Jan. 4); 78 (Jan. 11); 127 (Jan. 18); 192 (Jan. 25) 1934.
Wessler, H., and Hannell, H.: Benign Pulmonary Tuberculosis with Diabetes, Am. Rev. Tuberc. **27:** 47 (Jan.) 1933.
Wiener, J. J., and Kavee, J.: Pulmonary Tuberculosis and Diabetes Mellitus, ibid. **34:** 179 (Aug.) 1936.

2. Bayne-Jones, Stanhope: The Effects of Carbohydrates on Bacterial Growth and Development of Infection, Bull. New York Acad. Med. **12:** 278 (May) 1936. Himwich, H. E.: Blood Sugar in Experimental Diabetes, ibid. **12:** 284 (May) 1936. Tolstoi, Edward: Blood Sugar in Diabetes Mellitus, ibid. **12:** 295 (May) 1936. Mosenthal, H. O.: Hyperglycemia: Evaluation in Treatment of Diabetes Mellitus, J. A. M. A. **105:** 484 (Aug. 7) 1935.

3. Wilder, R. M.: Clinical Investigations of Insulins with Prolonged Activity, Ann. Int. Med. **11:** 13 (July) 1937.

4. Tolstoi, Edward, and Weber, F. C., Jr.: Protamine Zinc Insulin: A Clinical Study; Report of a Group of Diabetic Patients in Whose Cases Glycosuria Was Disregarded for One Year, Arch. Int. Med. **66:** 670 (Sept.) 1940.

Finally, protamine zinc insulin minimizes nervous tension for the patient, since it is administered only once a day, and not a single meal need be taken on schedule time or hurried within a given number of minutes after an injection, which often has to be taken under improvised, more or less exposed and trying conditions when therapy with regular insulin is used.

For all these reasons it was thought pertinent that a study of the comparative results obtained with protamine zinc insulin and with regular insulin in the treatment of diabetes complicated by tuberculosis should be undertaken.

The present study was carried out on 349 patients with diabetes complicated by tuberculosis treated at the Sea View Hospital from 1934 to 1939 inclusive. The diabetes of 71 patients was successfully controlled by diet alone, leaving 278 cases in which the effect of protamine zinc insulin and of regular insulin could be compared. Regular insulin was used exclusively in 131 and protamine zinc insulin alone or combined with regular insulin in 147 cases. Since the introduction of protamine zinc insulin in 1936, nearly all patients have been treated with this insulin.

The status of the tuberculosis on discharge from the hospital was determined for the patients given protamine zinc insulin and compared with that of those given regular insulin. Data on all patients receiving insulin are included in table 1. The figures indicate that protamine zinc insulin has a more favorable influence on the clinical course of tuberculosis than has regular insulin. Of the 147 patients receiving protamine zinc insulin the tuberculosis became arrested or apparently arrested in 22.4 per cent, showed improvement in 6.1 per cent, remained stationary in 22.5 per cent, progressed in 30.6 per cent and resulted in death in 18.4 per cent, while in the 131 treated with regular insulin the tuberculosis was arrested or apparently arrested in 13 per cent, remained stationary in 9.1 per cent and progressed in 33.6 per cent, and 44.3 per cent of the patients died.

A number of patients died or left the hospital within a few months after admission, making the period of observation somewhat brief for an evaluation of the effect on tuberculosis of either type of insulin. Such cases are omitted from table 2, and only those in which protamine zinc insulin or regular insulin has been received for more than six months are included. The data here again show that protamine zinc insulin has a distinctly more favorable influence on the course of the tuberculosis than does regular insulin. The tuberculosis became arrested or apparently arrested in 32.5 per cent of the patients treated with protamine zinc insulin compared to 21.9 per cent of the patients given regular insulin; progression of the disease or a fatal termination occurred in 28.9 per cent of the group given protamine zinc insulin, while 73.4 per cent of those given regular insulin showed an unfavorable clinical course.

TABLE 1.—*Comparison of Clinical Course of Tuberculosis in Persons with Diabetes Treated with Protamine Zinc Insulin or with Regular Insulin, Including all Cases Regardless of the Duration of Insulin Therapy*

Status of Tuberculosis at End of Hospital Stay	Regular Insulin		Protamine Zinc Insulin	
	Number	Per Cent	Number	Per Cent
Total cases	131		147	
Arrested cases	0	0	5	3.4
Apparently arrested cases	17	13.0	28	19.0
Regressive cases	0	0	9	6.1
Stationary cases	12	9.1	33	22.5
Progressive cases	44	33.6	45	30.6
Deaths	58	44.3	27	18.4

The conclusion that protamine zinc insulin was more efficacious than regular insulin might be questioned on several points. Among these are the degree of tuberculosis on admission, the type of therapy accorded the pulmonary disease and the selection of patients in the two groups. No special choice of patients was made for the administration of protamine zinc insulin or of regular insulin. Since the latter part of 1936 nearly all patients requiring insulin were given protamine zinc insulin, whereas previous to that time regular insulin was in routine use; hence the factor of insulin grouping of the patients is eliminated. The grade of the tuberculosis on admission would affect the clinical course; however the stage of the tuberculous process on admission was essentially the same for the two groups. Of the patients receiving protamine zinc insulin for more than six months, 7.3 per cent had a minimal lesion on admission and 39.7 per cent moderately advanced disease, and 53 per cent far advanced disease, while in the group given regular insulin 10.9 per cent had minimal, 34.4 per cent moderately advanced and 54.7 per cent far advanced tuberculosis when they entered the hospital. Variation in the type of treatment for tuberculosis might account for the better results with protamine zinc insulin, but at Sea View Hospital the form of treatment had not appreciably changed since 1934. In support of this is the fact that surgical measures had been used in 56 per cent of the group given protamine zinc insulin and in 53 per cent of those given regular insulin, though the latter were largely those in the hospital prior to 1937 and the patients given protamine zinc insulin after that time.

TABLE 2.—*Comparison of Clinical Course of Tuberculosis When Treatment with Protamine Zinc or Regular Insulin Was of More Than Six Months' Duration*

Status of Tuberculosis at End of Hospital Stay	Regular Insulin		Protamine Zinc Insulin	
	Number	Per Cent	Number	Per Cent
Total cases	64		83	
Arrested cases	0	0	5	6.0
Apparently arrested cases	14	21.9	22	26.5
Regressive cases	0	0	9	10.9
Stationary cases	3	4.7	23	27.7
Progressive cases	19	29.7	17	20.5
Deaths	28	43.7	7	8.4

SUMMARY

Since protamine zinc insulin exerts a more effective control of diabetes mellitus than regular or unmodified insulin, it was thought possible that in cases of diabetes complicated by tuberculosis the tuberculosis might be favorably influenced by protamine zinc insulin compared to unmodified or regular insulin. The records of Sea View Hospital reveal that in 349 patients with diabetes complicated by tuberculosis treated from 1934 to 1939 inclusive, of whom 274 received insulin, the clinical course of the tuberculosis was distinctly more favorable with protamine zinc insulin than with unmodified or regular insulin.

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PREPARATION AND TRANSFUSION OF SAFE UNIVERSAL BLOOD

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The use of blood belonging to group O as "universal blood" has been practiced for many years. With the rapid increase of the number of transfusions, it has become evident that the transfusion of universal blood is not as safe a procedure as was originally believed. The blood cells of group O cannot be responsible for reactions following a transfusion of universal blood because, with rare exceptions, they are not agglutinated by any kind of human serum at body temperature. The reactions obtained are attributed by many authors to the blood plasma of the donor containing the isoagglutinins anti-A (α) and anti-B (β). In the majority of cases the titer of these agglutinins is not high enough to cause trouble, but in some instances the titer may be high or even extremely high. Cases have been reported in which there are titers occasionally reaching 500 and more. Justification for the administration of universal blood is based on the fact that the blood fluid of the donor's blood will be diluted sufficiently by the blood fluid of the patient to render ineffective the isoagglutinins present in the donor's blood. It is obvious that the dilution factor in high titered O bloods is not sufficient to prevent reactions.

Recently an amendment to the Sanitary Code of the State of New York was adopted by the Public Health Council (June 26, 1940) requiring group O blood to be titrated before it is used as universal blood in order to avoid so-called dangerous universal blood with a high titer of isoagglutinins. There are a number of reports in the literature referring to this dangerous universal blood. The most elaborate analysis of the question was carried out by Gesse,[1] director of the Institute for Blood Transfusion in Leningrad, whose work on hemolytic shock after blood transfusion was the subject of an editorial in THE JOURNAL.[2] Gesse described 46 cases of hemolytic shock following the transfusion of universal blood, 20 of which caused death of the patient. On the basis of his investigations Gesse formulated the following three postulates:

1. Not more than 100 to 200 cc. of universal blood should be transfused.

2. The number of erythrocytes and the hemoglobin content in the blood of the recipient must be determined. Transfusion of universal blood is permissible if the number of erythrocytes is above 2 millions.

3. The titer of the donor's blood serum toward the erythrocytes of the recipient must be determined. Only the blood of a universal donor with a titer of 1:8 to 1:16 can be used.

Even if these three postulates are kept in mind, Gesse warns against the use of the blood of a universal donor unless, in a case of real emergency, homologous blood is not available. He opposes the use of universal blood on a large scale under wartime conditions. He points to the fact that even if hemolysis is not demonstrable after the transfusion of universal blood into a patient with A or B blood, definite signs of reactions are observed on the part of the nervous system and the cardiovascular system, particularly in regard to the pulse rate.

While it is not within the scope of this article to discuss the advantages and disadvantages of using universal donor's blood in transfusions, the question arises whether it would be possible to develop a procedure which would reduce the reactions following the transfusion of universal blood. More specifically, the problem consists in the elimination of the interaction between the isoagglutinins of the donor's blood and the isoagglutinogens of the patient's cells. Antibodies are best neutralized by the addition of the homologous antigen. A complex carbohydrate-like substance plays an important part in the composition of the so-called group-specific substance A, according to investigations carried out during recent years,[3] particularly by Landsteiner and his co-workers.[4] Convenient sources for the isolation of group-specific substance A are commercial pepsin, mucin and peptone.[5] In a previous paper we[6] reported observations on transfusions of group O blood to which a few milligrams of the isolated A-specific substance had been added. The addition of 25 mg. of A-specific substance to 500 cc. of group O blood reduces the titer of the isoagglutinin anti-A considerably or, at times, even completely. The transfusion of such blood into patients with blood belonging to group A proved to be satisfactory.[6]

In order to obtain really "safe" universal blood not only the isoagglutinin anti-A but also the isoagglutinin anti-B had to be neutralized. While studies of the A-specific substance had revealed its nature some time before, conclusive data were not available regarding the B property. After a number of ineffective attempts to isolate the B factor from blood and tissue from various sources, the B substance was finally isolated from the gastric juice of human beings belonging to group B.[7] The B substance is a carbohydrate-like substance chemically similar to the A-specific substance and also similar to the complex carbohydrates which are recognized as the bearers of the type specificity of pneumococci and other organisms.

After the A-specific and B-specific substances were made available, transfusions were performed with universal blood in which both isoagglutinins anti-A and anti-B were treated with their homologous antigens. The procedure itself is carried out in the following manner:

A 1:1,000 stock solution of group-specific substances is prepared. Twenty-five cc. of stock solution of A substance and 10 cc. of stock solution of B substance are kept in vaccine bottles under sterile conditions and

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added to 500 cc. of citrated blood of group O at least five minutes previous to the administration of the blood. It is obvious that the substances could be added to the citrated solution before blood is collected. Somewhat less B substance than A substance has been used because (1) in many instances the anti-B factor in group O blood is weaker than the anti-A factor and (2) there is occasionally a slight reduction of the anti-B factor to be observed by the addition of the A substance, apparently caused by some kind of cross reaction between the A and B substances.

The group-specific substances combine rapidly with the isoagglutinins, as proved by experiments in vitro. The effectiveness of the procedure is demonstrated by comparison of the donor's plasma before and after the addition of the group-specific substances. A few cubic centimeters of blood is taken out of the flask containing 500 cc. of citrated blood of group O. Plasma of blood of group O contains the isoagglutinins anti-A and anti-B. Their strength is determined by mixing serial dilutions of the plasma with human red

Agglutination of Human Red Blood Cells of Group A and Group B Respectively by Plasma of Group O

Test	Dilution of Plasma	Part 1 Before the Addition of Group-Specific Substances		Part 2 After the Addition of Group Specific Substances	
		Group A Cells	Group B Cells	Group A Cells	Group B Cells
1	Undiluted	++++	++++	++	+
2	1:2	++++	++++	+	—
3	1:4	++++	++++	—	—
4	1:8	++++	+++	—	—
5	1:16	+++	+++	—	—
6	1:32	++	++	—	—
7	1:64	++	+	—	—
8	1:128	+	+	—	—
9	1:256	+	—	—	—
10	1:512	—	—	—	—
11	1:1,024	—	—	—	—
12	Saline control	—	—	—	—

Symbols: — = no agglutination; + = slight agglutination; ++ = moderate agglutination; +++ = strong agglutination, and ++++ = very strong agglutination.

cells belonging to group A and group B respectively. The A-specific and B-specific substances are added before the transfusion is started. The last 5 cc. of blood is collected in a test tube, and the plasma of this specimen is compared with that obtained before the addition of the group-specific substances. A typical experiment is here described:

Decreasing amounts of plasma (volume 0.2 cc.) [part 1, collected before the addition of the group-specific substances, and part 2, collected after the addition of the group-specific substances] are mixed with 0.2 cc. each of a 1 per cent suspension of human red blood cells belonging to group A and group B respectively. After standing for ten minutes at room temperature the tubes are centrifuged for about one minute. The resulting agglutination is recorded in the accompanying table.

The table shows that the plasma of this "universal blood" agglutinates A cells in dilutions up to 1:256 and B cells in dilutions up to 1:128. The addition of the group-specific substances results in a reduction of the agglutinating potency of the plasma to 1:2 and 1:1 respectively. It should be stated in this connection that there has been no general agreement reached as yet as to the method and technic of determining the titer of isoagglutinins. Some workers prefer to keep the tubes at room temperature without centrifugation, while others observe agglutination on slides. Centrifugation of the test tubes increases the degree of agglutination.

So far group O blood that has been conditioned by the addition of A and B substances has been used in forty transfusions. In some instances only the A-specific substance and in other instances only the B-specific substance was added when patients known to have blood of group A or B respectively were treated. About half of the transfusions given contained A and B substances combined. Some of the patients received several transfusions at intervals of ten days to three weeks. No reactions were observed which could be attributed to the administration of group O blood conditioned in the way described or to the effectiveness of the isoagglutinins present in group O blood. It is obvious that the percentage of minor reactions following transfusions is not influenced at all by this procedure. A rise in temperature and urticaria may occur just the same as if untreated blood had been used. Reactions caused by overloading of the circulation or faulty technic certainly are not influenced at all by the neutralization of the anti-A and the anti-B factors in group O blood. The only accomplishment resulting from the addition of A and B substances consists in the neutralization of the possible effect of the anti-A and anti-B factors in group O blood. It is understood that blood of group O exclusively must be used as universal blood and not blood of different blood groups. While it seems to be possible to influence the isoagglutinins present in the blood fluids by the addition of the group-specific substances, it is not possible to change the cell properties A and B present in the blood cells themselves.

COMMENT

The A and B specific substances referred to in this paper are carbohydrate-like structures similar to those isolated from pneumococci and other micro-organisms. These substances are referred to as "haptens" because they usually do not stimulate the production of antibodies when injected intravenously into rabbits. A detailed report on this phase of the investigation will be published elsewhere.

It is interesting to observe that the addition of group-specific substances to normal human serum containing the respective isoagglutinins does not result in precipitation. In order to demonstrate the potency of group-specific substances toward normal isoagglutinins the method of inhibition of agglutination may be applied. This method consists in mixing decreasing amounts of group-specific substances with a constant amount of normal serum containing the respective isoagglutinin anti-A or anti-B. If, for instance, the A substance is mixed with serum containing the anti-A factor an almost immediate combination occurs resulting in neutralization of the anti-A agglutinin as well as of the isolysin anti-A. The degree of that neutralization can be determined quantitatively. The fact that these antibodies have been neutralized is demonstrated by subsequent addition of the A and B cells respectively. There is no agglutination if the isoagglutinins have been neutralized. By means of this test it can be shown that dilutions up to one in several millions may exhibit definite neutralizing effect.

The group-specific substances are protein free. One per cent solutions, when tested with sulfosalicylic acid, do not show any trace of protein. The Molisch reaction in a 1:1,000 dilution is strongly positive, and the products of hydrolysis in acid solution display a high percentage of reducing substances.

SUMMARY AND CONCLUSIONS

The addition of the isolated group-specific substances A and B leads to a reduction in strength or even elimination of the antibodies anti-A and anti-B present in the so-called universal blood of group O. These group-specific substances, carbohydrate-like in nature, can be added to the blood either before or after collection. Universal blood conditioned in the manner described can be given to any patient independently of the blood group to which he belongs without the necessity of previous determination of the patient's blood group and in emergencies even without cross matching. This blood, when kept in blood banks, is available for immediate use. When it is employed exclusively for all transfusions, no possible mix-ups with blood of different blood groups can occur, one of the main causes of fatalities from transfusion even in the most carefully conducted and supervised laboratories.

Serious objections against the indiscriminate use of universal blood have been raised by a number of investigators, some of them even warning against its use on a large scale in time of war. By eliminating the main objection, namely the possible interference of the isoagglutinins anti-A and anti-B with the A and B cell properties of the patients, such "safe" blood of group O may be considered a "universal" blood. It is obvious that the group-specific substances can also be used advantageously in the reduction of the anti-A and anti-B factors in plasma and serum when indicated.

100 High Street.

URTICARIA DUE TO ALIPHATIC ALDEHYDES

A CLINICAL AND EXPERIMENTAL STUDY

BEN Z. RAPPAPORT, M.D.
AND
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A survey of the literature does not reveal a report of allergy to aldehydes other than formaldehyde. While specific hypersensitivity to solution of formaldehyde either in a free state or as a condensation product in plastics is well recognized and not rare, only 1 such case has ever been studied experimentally. Horsfall [1] in 1934 made a thorough immunologic study of a patient specifically sensitive to formaldehyde. This patient, unlike the one concerned in this study, reacted to formaldehyde only and not to any other homologous aliphatic aldehyde. Horsfall obtained positive cutaneous reactions by the intracutaneous injection not only of formaldehyde (1:8,000,000) but also of various heterologous proteins treated with formaldehyde. A reaction was not obtained with control injections of the proteins not treated with formaldehyde. Despite these specific cutaneous reactions with formaldehyde and proteins treated with formaldehyde, passive transfer antibodies could not be demonstrated in this study.

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Dr. C. D. Hurd of the Department of Organic Chemistry, Northwestern University, gave valuable advice and supplied some of the rarer compounds; Drs. W. H. Welker, A. G. Cole and Cecil C. Harvey of the Physiological Chemistry Department, University of Illinois College of Medicine, gave valuable advice.

1. Horsfall, F. L., Jr.: Formaldehyde Hypersensitiveness: An Experimental Study, J. Immunol. 27:569-581 (Dec.) 1934.

REPORT OF CASE

History.—A white man aged 27 reported to the allergy clinic of the Research and Educational Hospital, University of Illinois College of Medicine, in July 1937 after a tentative diagnosis of urticaria had been made in the dermatology department of the same institution. The symptoms had first appeared early in July. The patient stated that the onset was gradual, with itching and burning, followed by the appearance of small lesions on the terminal phalanges of the second and third fingers of the right hand and swelling of the upper or lower lip several times a day for about one week. Following the week of onset the lesions became generalized, appearing, in the main, during the evening and night. Sleep became almost impossible. The hives were typical, universal in distribution, pinpoint to giant size (1 to 60 cm. in diameter).

Prior to this time the patient had enjoyed normal health. He had been engaged for the previous four years as a research worker in histology and at the same time completed a course in dentistry. He had always been actively engaged in athletics. In the past he had shown no dermatologic disturbances or allergic manifestations.

The father, mother, two brothers and three sisters are all living and in good health. The father had attacks of asthma for two years prior to the birth of the patient. The cause of the asthma was attributed to dye vapors which he encountered as an employee in the fur dyeing industry. When he changed his vocation, the asthmatic condition disappeared.

Physical Examination.—This was essentially negative except for dermatographia. A mild phytodermatosis between the toes on both feet was detected. Treatment with a salicylic acid ointment for two weeks caused this to disappear, but the hives persisted.

Allergic Study.—Intracutaneous tests were done with food and environmental substances while other allergic studies were being carried out. Positive cutaneous reactions were obtained with the following: garlic (questionable); 1 plus reactions with banana, hops, cabbage, blackberry, peanut, cocoa, olive, cantaloupe; 2 plus to 4 plus with pea, tea, carrot (well defined), parsnip (very well defined), blueberry, orris root, pyrethrum (well defined). These reactions seemed unrelated to the hives, since the complete elimination of the substances involved caused no change in the condition. It will be noted, however, in the discussion later, that the positive cutaneous reactions may not be without significance in relation to the actual causes of symptoms.

It was early suspected that formaldehyde might be the cause for the patient's urticaria because of his daily contact with it in his work. However, a vacation of two weeks, during which time the patient carefully avoided histologic laboratories or contact with any formaldehyde, failed to bring relief. Because of the constant presence of hives during the first five months of the ailment, it was impossible to study the clinical effect of exposure to formaldehyde or to any other suspected substance.

Dietary studies rigidly carried out for weeks likewise failed to produce benefit. Because of his well nourished condition and the severity of the symptoms, the patient submitted to a starvation period of one week during which time he took only water and rye crackers, without improvement. Elimination of rye was likewise without effect. The effect of removal of various environmental factors by having the patient sleep in a bare room on a canvas cot likewise failed to affect the condition. Physical factors were also ruled out as a cause of his urticaria. Neither heat nor cold influenced the condition.

During the fifteen months that the symptoms persisted the study was continued. No focus of infection was found. Because of the presence of epigastric distress, gastrointestinal studies, including roentgen and stool examinations, were made and found negative except for the presence of hypochlorhydria. The basal metabolism rate was normal. The therapeutic measures that were used to give relief were of little benefit. Hydrochloric acid given orally and intravenously (15 cc. of a 0.05 per cent solution for one week), the daily use of histamine by injection and calcium lactate intravenously produced no improve-

ment. Some relief from itching was obtained by using potassium chloride (30 to 100 grains [2 to 6.5 Gm.] daily by mouth) and an "acid ash" diet. Injections of splenic extract likewise gave relief from itching. The most reliable therapeutic agent for the relief of itching, discovered by the patient, was 1 ounce (30 cc.) of whisky taken four times a day. This proved to be about as effective and more pleasant than frequent injections of solution of epinephrine hydrochloride.

TABLE 1.—*The Effect of Formaldehyde Through Gastric and Through Intestinal Absorption*

	Enteric Coated Capsules *			Gelatin Capsules *		
	Symptoms		Time Between Taking Capsule and Onset of Symptoms	Symptoms		Time Between Taking Capsule and Onset of Symptoms
Dilution	Flushed Face	Flushed Face and Hives		Flushed Face	Flushed Face and Hives	
1:1,000,000	..	..	.....	..	..	.....
1:100,000	..	..	.....	..	..	.....
1:10,000	..	..	.....	+	..	18 minutes
1:1,000	+	±†	4 hours, 20 minutes	+	+†	15 minutes
1:100	++	++	4 hours, 15 minutes	++	+++	22 minutes, flushed face in 20 minutes
1:10	++	++‡	4 hours, 50 minutes	+++	+++‡	18 minutes, same

* Twenty-four hours elapsed between successive tests.
† The hives persisted for two to three hours.
‡ The hives persisted intermittently for ten to fifteen hours—itching, restlessness and poor sleep.

During the fifteen month period of symptoms, the patient, a heavy cigaret smoker, was not instructed to abstain from smoking. When the history was reexamined it was noted that at the onset of the hives itching first appeared on the lips and on the fingers of the right hand. This suggested the possibility of cigaret smoking as a cause of the urticaria. To our surprise, the hives subsided completely when smoking was discontinued. To satisfy his own finding, the patient again tried his accustomed brand of cigarets. The hives reappeared after he smoked one or two cigarets. An inquiry from the leading manufacturers for the composition of their cigarets was answered by the statement that the formula was a "trade secret." However, because of the occurrence of hives with brands made by several different manufacturers, the inference was that the harmful agent was a common component of cigarets. Combustion products of glycerin were suspected. This was confirmed by the absence of hives after the patient smoked cigarets which contained diethylene glycol instead of glycerin as the hygroscopic agent. When, however, a small amount of glycerin was introduced with a toothpick into this cigaret, hives occurred after smoking. So sensitive was the patient at this time that during periods of freedom from symptoms hives would appear a few minutes after entering a smoke filled room, or even after shaking hands with some one who had been smoking cigarets shortly before.

On the basis of the known chemistry of the combustion of glycerin, it was suspected that acrolein, $CH_2 = CH\text{-}CHO$, a pungent and irritating unsaturated aldehyde, was responsible for the reaction. To check this, acrolein was prepared by heating glycerin in the presence of potassium bisulfate. The residue thus obtained was applied to the fingers or lips with a glass rod. Within fifteen minutes the patient broke out in generalized hives. This was further confirmed by the occurrence of hives after eating shallow fried or broiled foods, a process in which a variable amount of acrolein is produced through the oxidation of fat. Deep fried foods (probably because heating of these is less intense) did not produce urticaria. It was interesting to observe that while discomfort did not occur after a meal of boiled beef or fish, the same foods when broiled produced severe urticaria.

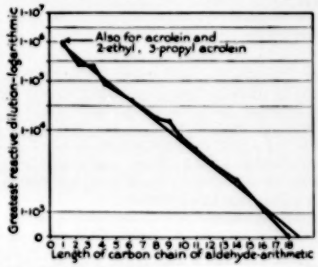
Psychogenic Factors.—The many fruitless attempts at an etiologic diagnosis during the long period of study often tempted us to attribute the urticaria to emotional disturbances. There was, however, no manifest reason to suspect any unusual emotional strain during the period of symptoms. Following the discovery of the relationship of the urticaria to acrolein (and related aldehydes) the patient went through a prolonged period of severe stress, occasioned by the serious illness of his only child, without the recurrence of hives except when induced experimentally.

EXPERIMENTAL OBSERVATIONS

The discovery that the hives could be produced by acrolein again drew our attention to formaldehyde, the aldehyde first suspected as the cause of the hives. There was now a credible explanation for the failure of the hives to clear up when the patient was not in contact with formaldehyde. The use of solution of formaldehyde in the laboratory quickly demonstrated that this compound was also capable of producing in the patient a severe attack of urticaria. We therefore set out to study the effect on the patient of various aldehydes.

The purposes of the experiment were as follows: (1) to determine the effect of other aldehydes related to formaldehyde (aliphatic aldehydes), the concentration necessary for symptoms and the various sites of absorption; (2) to study the effect of unrelated aldehydes, i. e. the aromatic aldehydes; (3) to attempt to determine the effective part of the molecular structure in the production of symptoms.

Experiments with Formaldehyde.—Formaldehyde (HCHO), the first of the series of aliphatic aldehydes, was used in our first studies. All the dilutions were by volume and on the basis of 100 per cent formaldehyde. One drop of a 1:1,000,000 solution of pure formaldehyde in water placed on the lip produced local urticaria of the lip in a few minutes, followed by mild generalized urticaria within ten minutes. To determine whether contact with the skin or mucous membranes was necessary for this effect, 0.02 cc. of a 1:10,000,000 solution of formaldehyde was injected intramuscularly. Contact with the skin or subcutaneous tissue was avoided by using a fine gage needle introduced through a larger bore needle which was first inserted into the biceps muscle. The inner needle was removed after the injection was completed and before the protecting sleeve was withdrawn. Urticaria occurred within thirty-five minutes after this injection; first on the volar surfaces of the forearms and then on the neck and about the waistline.


Also for acrolein and 2-ethyl, 3-propyl acrolein
Greatest reactive dilution—logarithmic
Length of carbon chain of aldehyde—arithmetic

Relation of straight chain aldehydes in their capacity to produce urticarial reaction.

To determine the effect of absorption from the gastrointestinal tract, the following tests with dilutions of formaldehyde were performed:

1. Dilutions on a volume basis of pure formaldehyde, ranging from 1:10 to 1:1,000,000, were prepared in gelatin capsules with lactose as a medium. Two sets of capsules were made for each dilution. One set was

enterically coated.[2] Care was taken that the patient did not expose himself to vapors or solution of formaldehyde for a period of two days preceding and during the test period. After ingestion of any single capsule, twenty-four hours was permitted to elapse before a subsequent trial was made. Table 1 shows the dilutions, trials and results in detail. Slight symptoms (flushed face) occurred with one drop of a 1:1,000 solution of formaldehyde in the gelatin capsules and definite urticaria with the 1:100 solution. With the enteric coated capsules a higher concentration of formaldehyde (1:100) was required for a definite reaction. It is interesting, in view of the effectiveness of the high dilution (one drop of a 1:1,000,000) placed on the lip, that a much higher concentration was necessary to produce urticaria by way of the gastrointestinal tract.

Other Aliphatic Aldehydes.—The effects of other aliphatic aldehydes up to a molecular chain of eighteen carbon atoms were next studied. Serial dilutions up to 1:1,000,000 of the pure aldehydes were tested. Those below the octaldehyde were diluted in distilled water. Those with more than eight carbon atoms were first dissolved in an equal volume of 95 per cent alcohol before further dilutions were made with distilled water. A few drops of the dilution tried were applied to the lips with a glass applicator.

TABLE 2.—*Classification of Substances Used Experimentally: Negative Reaction with All Conjugated (Aromatic and Aliphatic) Aldehydes; Positive Reaction Only with Nonconjugated Aldehydes and Acrolein*

Substances Tested	Classification	Urticarial Reaction	Time of Onset
Benzaldehyde	Aromatic (conjugated)	Negative	.....
Salicylic aldehyde	Aromatic (conjugated)	Negative	.....
Vanillin	Aromatic (conjugated)	Negative	.....
Furfural	Heterocyclic (conjugated)	Negative	.....
Sulfapyridine	Ana-amino-pyridine	Negative	.....
Allyl acetal (Hurd)	Acetal	Negative	.....
Vinyl allyl ether * (Hurd) (CH_2=CH—O—CH_2—CH=CH_2)	Ether	Negative	.....
Cinnamic aldehyde	Aromatic (conjugated)	Negative	.....
Crotonaldehyde	Aliphatic (conjugated)	Negative	.....
Citronellal	Aliphatic (nonconjugated)	Positive	20 minutes
Allylacetaldehyde (Hurd)	Aliphatic (nonconjugated)	Positive	Few minutes
Formaldehyde to 18th carbon aliphatic saturated aldehyde (and acrolein; see chart	All aliphatic, all nonconjugated (except acrolein, see text)	All positive	Seconds to minutes

* This compound was tried because it easily hydrolyzes by action of hydrochloric acid to acetaldehyde.

All simple, continuous chain aldehydes up to stearic aldehyde, $C_{17}H_{35}CHO$, produced an urticarial reaction. However, as the number of carbon atoms in the aldehyde molecule became greater, the concentration required to produce a reaction was proportionately greater (shown in the accompanying chart). Conversely, the shorter the carbon chain the more effective the aldehyde. The range of dilution ran from 1:1,000,000 for formaldehyde to 1:1 for the aldehyde containing 18 carbon atoms. Interestingly, the curve of concentrations required for a minimal reaction corresponds to the tendency of the solubility curve of these aldehydes. Horsfall [3] in his report suggests that the presence of formaldehyde in traces, as a contaminant in the higher aldehydes, should be ruled out. The Collins-Hanzlik modification of the phloroglucinol test for free formaldehyde was carried out on higher aldehydes that gave a positive reaction. The result was negative in all cases. The test is sensitive for detection of formaldehyde in a dilution of 1:1,000,000.

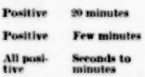
CONJUGATION VERSUS NONCONJUGATION

Early in the trials with the various aldehydes it was noted that certain aliphatic double bonded aldehydes and aromatic aldehydes such as benzaldehyde (table 2) did not produce urticaria. Furfural likewise gave a negative result. To investigate further these preliminary experiments, a series of aliphatic double bonded aldehydes and certain aromatic aldehydes were used after the patient had gone through a prolonged period of freedom from hives (table 2).

The results (table 2) showed no reaction with all the aldehydes of these two groups. Inquiry into the difference between the chemical behaviors of the nonreactive and the reactive aldehydes revealed that those failing to produce reactions possess conjugate unsaturation except in one case, namely acrolein, whereas those producing reactions are nonconjugated compounds.[3]

Since no conjugated aliphatic aldehyde except acrolein produced urticaria in this patient, while all nonconjugated aliphatic aldehydes produced urticaria, a possible explanation of this phenomenon presents itself. It is assumed that the effective aldehydes combine with somatic proteins producing addition products (the allergen) to which the person is sensitive. The aldehyde radical in the nonconjugated compound is free to react with the protein to form such addition products, whereas the conjugated aldehyde, because of its lessened aldehyde reactivity, is unable to initiate this process.

Furfural is a common heterocyclic aldehyde,



Furfural, like benzaldehyde, failed to give rise to any urticarial symptoms.

Allylacetaldehyde, CH_2=CH—CH_2—CH_2—CH=O, was interesting to test because its two double bonds are not conjugated. This compound was found to display ordinary aldehydic reactivity when the patient was exposed to it. The onset of hives was produced in a few minutes.

Allyl acetal, CH_2—$CH(OCH_2CH$=$CH_2)_2$, is not an aldehyde but it possesses a potential aldehyde function, since it changes to acetaldehyde on hydrolysis with

2. The enteric coated capsules were prepared by J. D. Searle & Co., Chicago.

3. The phenomenon of conjugation is described briefly as follows: "Organic compounds that contain alternate double bonds in their skeleton such as C=C—C=C or C=C—C=O are classed as conjugated. The former type is a diolefin and the latter is an α,β-unsaturated aldehyde. Compounds of this type are considered to resonate between several electronic structures, with the net result that the activity of the compounds is less than one would infer from the presence of the two double bonds alone.

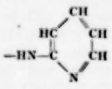
"Butadiene, for example, may exist not only as CH_2=CH—CH=CH_2 but also as $\dot{C}H_2$—CH=CH—$\dot{C}H_2$ (unshared electrons represented by dots). This explains why, in reaction with bromine, the major product is 1,4-dibromo-2-butene, $BrCH_2$—CH=CH—CH_2Br.

"The simplest aldehyde with conjugate unsaturation is acrolein, CH_2=CH—CH=$\ddot{O}$:. Its resonance modification is $\dot{C}H_2$—CH=CH—$\ddot{O}$:.

(All the unshared electrons are represented by dots. Each single bond represents two electrons, each double bond four electrons). Crotonaldehyde, CH_3—CH=CH—CH=O, represents the next member of this conjugated family. Acrolein and crotonaldehyde differ significantly in their chemical reactivity. If pure, the former will resinify spontaneously on standing for a few minutes, whereas the latter exhibits no such tendency. In general, aldehydes with conjugate unsaturation possess the comparative stability of crotonaldehyde rather than the reactivity of acrolein. This correlates with the activity of acrolein alone among conjugated aldehydes as found in the present work" (C. D. Hurd, personal communication to the authors).

acids. The compound was found to be ineffective in bringing about hives in the patient.

Sulfapyridine is not an aldehyde but its structure made it interesting to test, since the pyridine portion of the compound is substituted by nitrogen in the α position:



The portion of this compound resembles aldehydes in that two bonds from carbon pass to nitrogen, a negative atom like oxygen. In aldehydes or acetals, two bonds from carbon pass to oxygen. Although tests with sulfapyridine were also found to be negative in bringing on hives, it should be pointed out that the pyridine nucleus possesses conjugate unsaturation.

Results with the various compounds are summarized in table 2.

The results with the aromatic aldehydes (benzaldehyde, cinnamic aldehyde, salicylic adlehyde and vanillin), all of which failed to produce urticarial symptoms, lends further support to the application of conjugation and nonconjugation as an explanation for the presence or absence of reaction. The benzene ring is in itself a conjugate system because of the double bonds between alternate carbons of the ring, and the aldehyde group in the cases cited is conjugated with it. The aldehyde radical in such compounds is not free to react with proteins to produce the allergen to which the patient was sensitive.

COMMENT

The urticaria described lasted for fifteen months. The patient has been free from symptoms now since September 1938 except when hives have been experimentally produced. There is, therefore, no doubt of the causative factors. From a clinical point of view the study of this patient emphasized what experienced allergists so frequently underline—the importance of an intelligent, thorough history in the diagnosis of an allergic condition. In retrospect, the story of involvement of the fingers and lips at the onset should have immediately suggested some contact substance, expecially cigarets, as a cause. However, even this degree of diagnostic accuracy would not have sufficed. It is important to isolate the exact substance in the cigarets, not for academic reasons but for practical purposes. Otherwise the patient, while avoiding cigarets, would have continued to have urticaria from acrolein in fried and broiled foods, from formaldehyde in his occupation and from the many other aliphatic aldehydes found in many foods and commonly used essential oils.

In this connection we may now consider the possible significance of the positive cutaneous reactions found by intracutaneous tests in this patient. As previously mentioned, the elimination of the foods and environmental substances to which he reacted produced no change in his urticaria. While from a clinical point of view it is justifiable to assign no importance to such reactions in the absence of symptomatic improvement, it should be noted that most of the allergens previously listed contain in their volatile oils aliphatic aldehydes as well as other aldehydes which are partly responsible for their characteristic odor. Not only the foods but orris root and pyrethrum (pyrethric aldehyde) likewise contain aliphatic aldehydes. It is possible that the positive cutaneous reactions obtained with these substances were due to the minute amounts of aliphatic aldehydes present in the extract. Some confirmation of this was obtained by the following experiment recently done on the patient. At this time he had been free of hives for two years and eight months except when attacks were experimentally induced: Concentrated extract of garlic 0.3 cc. was applied to the lips and was permitted to be swallowed. Within three minutes the lower lip began to itch. After five minutes the patient felt an uncomfortable "knotty" epigastric distress characteristic of his exposure to acrolein or other aldehydes. After ten minutes, itching of the face, neck, soles, waistline, arms and face was intense. This was followed in a few seconds by severe generalized urticaria and edema. Despite this severe reaction, garlic on intracutaneous testing (with 0.02 cc. of a 1:100 solution of this concentrated extract) had in the original examination given only a questionable reaction.

From an experimental point of view, the question arises whether acrolein formed in the preparation of fried and well broiled foods may not be a cause of specific hypersensitivity. Intolerance to fried foods with symptoms suggestive of gallbladder disease may in some cases be an expression of gastrointestinal allergy to acrolein rather than of organic involvement of the gallbladder. Is the "heart burn" complained of by smokers due in some cases to specific acrolein sensitivity or is it always due to the known primary irritating qualities of this aldehyde or of other combustion products? It is difficult to investigate these symptoms in the absence of objective signs. We have evidence in at least one other patient sensitive to solution of formaldehyde that inhalation of acrolein will produce a typical migraine headache. It is our plan in a future study to combine various aldehydes with serum protein to form a nonirritating allergen for cutaneous tests as one of the methods for studying "heart burn" from cigarets and fried foods, precordial distress following cigaret smoking and other conditions which may possibly be due to aldehyde sensitivity.

SUMMARY AND CONCLUSIONS

1. A patient whose urticaria was of fifteen months' duration was found specifically sensitive to the aliphatic nonconjugated aldehydes ranging from formaldehyde to an eighteen chain aldehyde.

2. The aliphatic conjugated and the aromatic aldehydes failed to produce symptoms. The exception to this was acrolein, which, while structurally classified as a conjugated aldehyde, is sufficiently reactive to be grouped with the nonconjugated aldehydes.

3. The differences in the reactions with proteins of aromatic and conjugated aliphatic aldehydes as compared with the nonconjugated aliphatic aldehydes is offered as an explanation for the specific sensitivity of the patient to the last group and not to the first two groups of aldehydes.

4. Urticaria was produced with formaldehyde by contact with the unbroken skin, the lip, the stomach (gelatin coated capsules), the intestine (enteric coated capsules) and by intramuscular injection without immediate contact with the subcutaneous tissues. It is interesting that formaldehyde in gelatin coated capsules was more active than that in the enteric coated ones and that contact with the lip was more effective than either of these.

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NEOARSPHENAMINE TO MANAGE COURSE OF FEVER IN THERAPEUTIC MALARIA

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Recently Cole and his associates [1] reported on the results of injections of compounds of bismuth and other heavy metals with the object of enabling patients to recover from the effects of attacks of fever in therapeutic malaria. After a few days rest the attacks were allowed to continue till their number was deemed sufficient for the intended therapeutic effect.

In the Netherlands therapeutic malaria in the treatment of dementia paralytica has been applied since 1921. By the cooperation of the two psychiatric clinics in Amsterdam with the zoologic department of the Institute for Tropical Hygiene I have been enabled to keep in stock the strains of plasmodia necessary for the treatment and to maintain a station for the breeding of mosquitoes, so that the inoculation of patients can be carried out both by mosquito bite and by the injection of infected blood. Furthermore, by this means all the other university clinics and hospitals for persons with mental disease in the country can be provided with material for infection by mosquitoes or by blood.

Since 1921 the following parasitic strains have been used in the Netherlands:

1. Plasmodium vivax: (*a*) several strains originating from patients in regions in which benign tertian malaria is endemic (the provinces of North Holland and Friesland). These strains show no difference whatever among themselves nor do they differ in their behavior in response to the usual chemotherapeutic agents quinine and neoarsphenamine. Since 1933, however, for various reasons, these strains no longer have been in use. (*b*) the Madagascar strain, received from England (Horton Mental Hospital, Epsom) in 1927. This strain differs from the foregoing ones in some respects, particularly as to their sensitivity to neoarsphenamine. The Madagascar strain is still in use for inoculation both by mosquito bites and by the injection of blood.

2. Plasmodium malariae: This strain, the causative agent of quartan malaria, was obtained from Vienna (Wagner von Jauregg's clinic) in 1933. It is used mainly for patients in whom, because of their immunity, a sufficient number of attacks of fever cannot be obtained with P. vivax. This strain can be transmitted only by the injection of blood, as infection by mosquitoes succeeds only exceptionally.[2] P. malariae is refractory to injections of neoarsphenamine.

The Amsterdam clinics, like many institutions in the United States,[3] do not apply therapeutic malaria only but combine this treatment with neoarsphenamine in the usual increasing doses of 0.15, 0.3, 0.45 and 0.6 Gm. It soon appeared that neoarsphenamine has a double effect in the treatment of dementia paralytica, not only as an antisyphilitic drug but also in the management of the course of the fever in therapeutic malaria. The present study deals with the latter effect only.

Chart 1.—Inoculation with Plasmodium vivax, Dutch strain, by injection of infected blood. On the tenth day neoarsphenamine, 0.15 Gm., was given intravenously because of double tertian fever. Result: Three afebrile days, followed by four chills of simple tertian fever. Spontaneous resistance. Patient was afebrile with numerous parasites in thick blood film.

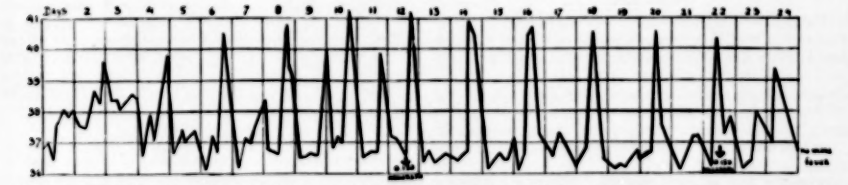

Chart 2.—Inoculation with P. vivax, Dutch strain, by injection of blood. On the twelfth day 0.15 Gm. of neoarsphenamine was given intravenously. Result: Simple tertian fever. On the twenty-second day 0.3 Gm. of neoarsphenamine was given intravenously. Result: Fever stopped after two days.

It has been known for many years that neoarsphenamine is useful in the treatment of patients with benign tertian malaria. Its use, however, is limited, since arsphenamine derivatives alone cannot definitely control the infection. For the final elimination of the malarial parasite quinine is necessary. After inoculation by the injection of blood the infection is always completely controlled by a dose of 5 Gm. of quinine administered in the course of five days. With this method of inoculation relapses do not occur.

Read before the Netherlands Society of Tropical Medicine, Nov. 10, 1940.

1. Cole, H. N., and others: Use of Bismuth Injections to Manage Course of Therapeutic Malaria, J. A. M. A. **115**:422 (Aug. 10) 1940.

2. de Buck, A.: Infection Experiments with Quartan Malaria, Ann. Trop. Med. **29**:171 (July) 1935.

3. Leary, P. A., and others: Malaria and Artificial Fever in Treatment of Paresis, J. A. M. A. **115**:677 (Aug. 31) 1940.

In cases of benign tertian malaria transmitted by mosquito bite, relapses do occur. As, however, by the large number of bouts of fever the patient acquires a high degree of immunity to the malarial infection, the number of clinical relapses is much lower than it is among other patients with malaria. Experience on this point obtained in the Netherlands is briefly summarized in table 1.

In view of these experiences in recent years the malaria course in the Amsterdam clinics, after inoculation both by injection of blood and by mosquito bite, has been cut short by a brief treatment with quinine for five to seven days.

Hardly any patient inoculated with P. vivax retains a tertian fever rhythm throughout the treatment, in the course of which the attacks of fever usually double in number and become quotidian. In some patients this occurs early in the series of attacks, in others only at the end. It is often deemed necessary to restore a tertian rhythm for the daily attacks. But even when the fever has preserved its simple type it may be desirable for clinical reasons (a tendency to collapse, general weakness, violent vomiting or incipient jaundice) to interrupt the fever for a few days.

For both purposes I inject a small dose of neoarsphenamine. Quinine is less suitable for these purposes, as its parasiticidal action is too strong, so that one obtains too long a remission, up to a few weeks.

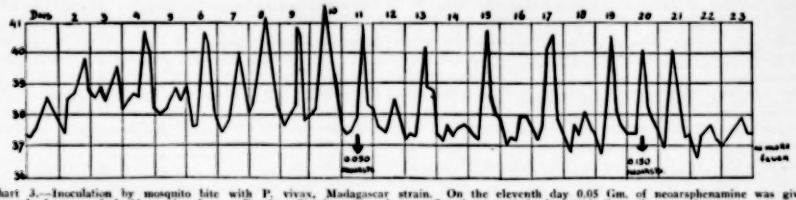

Chart 3.—Inoculation by mosquito bite with P. vivax, Madagascar strain. On the eleventh day 0.05 Gm. of neoarsphenamine was given intravenously because of double tertian fever. Result: Simple tertian fever. On the twentieth day 0.15 Gm. of neoarsphenamine was given intravenously. Result: Patient was afebrile after next day.

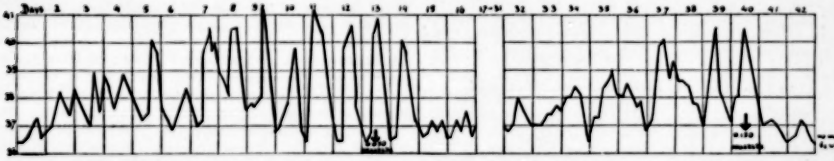

Chart 4.—Inoculation by mosquito bite with P. vivax, Madagascar strain. On the thirteenth day 0.05 Gm. of neoarsphenamine was given intravenously for double tertian fever. Result: Patient remained afebrile during three weeks, with numerous parasites in thick blood film.

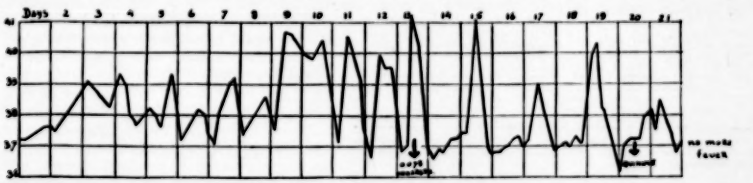

Chart 5.—Inoculation by mosquito bite with P. vivax, Madagascar strain. On the thirteenth day 0.075 Gm. of neoarsphenamine was given intravenously. Result: Simple tertian fever. On the twentieth day treatment with quinine was started.

The fact that neoarsphenamine suppresses benign tertian fever by a considerable reduction of the number of parasites in the peripheral blood is made use of to postpone the course of quinine until the antisyphilitic therapy with neoarsphenamine is altogether or nearly completed. In this way there is always blood available for inoculating fresh patients, even when there are no infected mosquitoes or febrile patients at hand, as after a one or two week pause in the neoarsphenamine treatment parasites are nearly always demonstrable in the peripheral blood. It is not necessary to wait until the patient becomes febrile again: In nonfebrile patients one often succeeds in demonstrating the parasites by the thick drop method, as long as no quinine has been taken.

A further application of neoarsphenamine is its use for managing the course of the fever.

In the course of several years I have obtained experiences with the Dutch strains of P. vivax as outlined in table 2 and have reached the following conclusions concerning these strains:

1. When the patient has double quotidian, an intravenous dose of 0.15 Gm. of neoarsphenamine applied after the attack of fever is as a rule sufficient to convert the duplicate fever into a simple (tertian) one. In one fourth of the cases there are first a few afebrile days. In about another 25 per cent the effect is insufficient; one can then repeat the dose after two to three days.

2. When one wants to interrupt the fever therapy for a few days in order to allow the patient to recuperate, an injection of 0.15 Gm. on an afebrile day is often sufficient for simple tertian fever. When this fails, one can repeat the dose after two to three days.

3. For the sake of definitely cutting short the fever therapy when one does not yet want to give quinine, a first injection of 0.15 Gm. of neoarsphenamine will often prove sufficient, but it is only after injecting 0.3 Gm., followed by the usual series (0.3, 0.45 and 0.6 Gm.) that one may feel sure of success. Treatment with quinine can then be given at the end of the course of neoarsphenamine.

series of neoarsphenamine injections is effective, beginning at 0.15 Gm. and increasing to 0.3, 0.45 and 0.6 Gm.

The effect of neoarsphenamine is clearly illustrated by the fever charts. These charts, like the tables, hardly need any comment. I want only to stress that the various strains of P. vivax differ in their response to the drug. The Madagascar strain responds readily to 50 to

TABLE 1.—*Clinical Relapses After Inoculation with Plasmodium Vivax (Benign Tertian Malaria) by Mosquito Bite*

Patients		Treatment Given	Period of Observation, Years	Relapses	
Description	Number			Number	Percentage
From North Holland (Report of the Malaria Committee of the Health Council 1936-1937, Versl. en mededeel. betreff. d. volksgezondh., July 1938, pp. 435-469)	Many hundreds	5 to 7 Gm. of quinine sulfate in 5 to 7 days	1½	...	50
From North Holland, Wormerveer (Report of the Malaria Committee of the Health Council 1938-1939, Versl. en mededeel. betreff. d. volksgezondh., July 1940, pp. 399-417)	309	Quinoplasmoquine for 2 weeks	1½	116	23
With dementia paralytica (Winckel, C. W. F.: Die Praxis der therapeutischen Malaria, Psychiat. en neurol. Bl. 39:1-291 [May-June] 1935)	58	5 Gm. of quinine sulfate in 5 days	1½	9	15.5
With dementia paralytica (Winckel, ibid.)	81	Quinoplasmoquine for 2 weeks	1½	9	11.1

In patients infected with the Madagascar strain of P. vivax a somewhat different behavior was seen, as is shown in table 3.

With the Madagascar strain of P. vivax I have made the following observations:

1. When the patient has double quotidian, one intravenous injection of 0.05 to 0.075 Gm. of neo-

TABLE 2.—*Effect on Fever of Single Injection of Neoarsphenamine*

Dose of Neoarsphenamine, Gm.	Indication	Number of Cases	Result			
			No Effect	Lowered Temperature	Simple Fever	Some Days' Remission
0.15	(a) Febris duplicata	141	25 (18%)	13 (9%)	69 (49%)	34 (24%)
	(b) A few days rest needed in simple fever	38	11 (29%)	7 (18%)	..	20 (53%)
0.3	(a) and (b) combined *	39	3 (8%)	2 (5%)	6 (15%)	28 (72%)
	Total	218				

* Neoarsphenamine kills the malaria parasites best when they are about twenty-four hours old. The injections should therefore be given on an afebrile day.

arsphenamine, given after the end of the attack of fever, as a rule suffices to convert the fever into simple tertian fever. The best results are obtained with 0.075 Gm.; if one gives patients with quotidian fever a dose of 0.1 or 0.15 Gm. the majority will enjoy a few days remission. Therefore, when one wants only to change the fever into a simple tertian one, a dose of 0.075 Gm. is nearly always sufficient.

2. When one desires to obtain a few days complete remission in order to restore the patient's forces, a dose of 0.05 Gm. of neoarsphenamine given on an afebrile day is often sufficient in simple tertian fever. The apyrexia lasts longer when the dose is raised to 0.1 or 0.15 Gm., the optimal dose being 0.1 Gm.

3. When a patient with double quotidian requires a few days rest, an injection of 0.1 or 0.15 Gm., given at the end of the attack of fever, is sufficient. In this case the optimal dose is 0.15 Gm.

4. In case one desires to withhold quinine and still definitely to terminate the fever therapy, the usual

75 mg. and the Dutch strains only to 150 mg. or more. When, therefore, one wants to make use of neoarsphenamine for managing the course of fever one must first make sure of the degree of sensitivity of the parasite strain in use. In addition one must keep in mind that the same amount of a given chemotherapeutic agent (and this is equally true with quinine as with neoarsphenamine) in general becomes more effective as the patient has passed through a greater number of chills and thus supports the action of the drug by an increased amount of resistance developed by his organism.

Useful as neoarsphenamine has proved itself for the regulation of the fever in benign tertian malaria, it is quite useless in quartan malaria (infection with P. malariae) the parasite of which is in no way affected

TABLE 3.—*Madagascar Strain of Plasmodium Vivax*

Dose of Neoarsphenamine, Gm.	Indication	Number of Cases	Result			
			No Effect	Lowered Temperature	Simple Fever	Some Days' Remission
0.05	(a) Febris duplicata	77	14 (39%)	3 (4%)	34 (46%)	21 (49%)
	(b) A few days rest wanted in simple tertian fever *	5	..	..	..	5
0.075	(a) Febris duplicata	66	3 (4.5%)	1 (1.5%)	37 (56%)	25 (38%)
	(b) A few days rest wanted in simple tertian fever *	2	..	..	..	2
0.1	(a) Febris duplicata	26	..	..	8 (31%)	18 (69%)
	(b) A few days rest wanted in simple tertian fever *	7	..	..	..	7
0.15	(a) Febris duplicata	16	..	..	2 (13%)	14 (87%)
	(b) A few days rest wanted in simple tertian fever *	22	..	..	..	22
	Total	216				

* Neoarsphenamine kills the malaria parasites best when they are about twenty-four hours old. The injection should therefore be given on an afebrile day.

by the drug. One can profit, however, by this state of affairs by combining fever therapy with a simultaneous series of injections of neoarsphenamine. This practice materially reduces the period during which the patient has to remain in the hospital.

SUMMARY

1. Therapeutic benign tertian malaria often produces undesirable effects when double quotidian develops or when the patient's forces of resistance are too much weakened by the chills and his life is endangered.

2. Intravenous injections of neoarsphenamine constitute a simple means for either changing a double fever into a simple one or for allowing the patient a few afebrile days.

3. Various strains of P. vivax are not equal in their sensitivity to neoarsphenamine, and one must first determine the dose required for the strain of parasite in use.

4. Neoarsphenamine cannot replace quinine in the treatment of malaria. For definitely cutting short the fever course, after inoculation by the injection of blood, 5 Gm. of quinine sulfate in five days is required and is sufficient; clinical relapses are not encountered.

5. In cases of infection with P. malariae (quartan malaria) neoarsphenamine is ineffective for obtaining a few days pause or for changing a double or triple fever into the simple quartan type.

THE FREI TEST FOR LYMPHOGRANULOMA VENEREUM

EXPERIENCES WITH A NEW ANTIGEN (LYGRANUM) PREPARED FROM INFECTED YOLK SAC OF DEVELOPING CHICK EMBRYO

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AND

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ST. LOUIS

Since the Frei cutaneous test is the principal confirmatory procedure for the diagnosis of lymphogranuloma venereum, much consideration must be given the availability and specificity of the "antigen" used in the test. At present three sources of antigen are recognized: (*a*) pus aspirated from the inguinal bubo of a patient with early lymphogranuloma venereum, (*b*) macerated material from diseased glands and (*c*) emulsions of the brains of mice intracerebrally infected with virus. Frei test antigen prepared from human pus is not readily available, since cases of lymphogranuloma venereum with fluctuant inguinal buboes are infrequent even in large venereal disease clinics. When such cases are encountered the pus is usually present in small quantities, may vary in "antigen" content in different patients and may be contaminated by the coexistence of other venereal diseases. Macerated material from diseased glands is likewise not readily available. The mouse brain antigen first described by Grace and Suskind [1] does not present these difficulties. An appropriate strain of virus may be transmitted indefinitely through mice.[2] Contamination may be eliminated with proper and careful laboratory technic, and antigens prepared from infected mouse brains can be standardized. Despite favorable reports [3] on the use of mouse brain antigen in the Frei cutaneous test, however, some controversy over the specificity of this antigen has developed. Strauss and Howard,[4] Wawersig [5] and Mesrobeanu and Bruckner [6] favored the use of the human pus antigen since they found that sensitivity to mouse brain frequently produced false positive reactions. Grace [7] insisted on the importance of the measurement of the papule produced by the mouse brain antigen and by the corresponding control as the only reliable means of differentiating between nonspecific reactions due to injection of foreign substance and reaction to the presence of the virus. The necessity for this type of exact measurement led Binkley and Love [8] and their associates to conclude that the test performed with mouse brain antigen is unreliable. European investigators found Frei antigen prepared from monkey brain to be less reliable than human pus antigen.[9]

DEVELOPMENT OF EGG YOLK SAC ANTIGEN

Several attempts have been made to propagate the virus of lymphogranuloma venereum on the chorioallantois of developing chicks. Miyagawa and his collaborators [10] transmitted the virus to mice after five passages in eggs and were able to demonstrate "granulocorpuscles" in the brains of infected mice. Burnet [11] also cultivated the virus on the allantoic membrane of hatching chicks, though no details were given as to the number of passages or the extent of infection. D'Aunoy and von Haam [12] were able to infect the allantois of developing chicks and described specific lesions produced on these membranes. Nauck and Malamos [13] were able to infect mice after transmitting the virus through six serial passages on the chorioallantoic membrane. According to these workers "granulocorpuscles" were not discernible in the preparations of membrane. In cases in which success was attained in the afore-

From the Laboratory Section and Venereal Disease Control Service of the St. Louis Health Division.

This study is incidental to the program of control of venereal disease sponsored by the St. Louis Health Division in cooperation with the United States Public Health Service.

1. Grace, A. W., and Suskind, Florence H.: Successive Transmission of Virus of Lymphogranuloma Inguinale Through White Mice, Proc. Soc. Exper. Biol. & Med. **29:** 71, 1934.

2. Levaditi, C.; Ravant, P., and Schoen, R.: Réceptivité de la souris à l'égard du virus de la maladie de Nicolas et Favre, Compt. rend. Soc. de biol. **109:** 285, 1932.

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4. Strauss, M. J., and Howard, M. E.: Frei Test for Lymphogranuloma Inguinale: Experiences with Antigens Made from Mouse Brain, J. A. M. A. **106:** 517 (Feb. 15) 1936.

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6. Mesrobeanu, I., and Bruckner, I.: Sur l'utilisation de l'antigène murin pour la réaction de Frei, Compt. rend. Soc. de biol. **124:** 978, 1937.

7. Grace, A. W.: Frei Antigen Prepared from Mouse Brain, Arch. Dermat. & Syph. **39:** 347 (Feb.) 1939.

8. Binkley, G. W., and Love, W. R.: Mouse Brain Lymphogranuloma Venereum Antigen: Clinical Experience at Cleveland City Hospital, Arch. Dermat. & Syph. **35:** 383 (Sept.) 1938.

9. Levaditi, Constantin; Durel, P., and Reinié, L.: La valeur diagnostique des antigènes de Frei d'origine simienne, Bull. Soc. franç. de dermat. et syph. **42:** 1639, 1935. de Blasio, R.: Sur l'unspécificité de la réaction de Frei. La réaction chez les tuberculeux, Bull. Soc. franç. de dermat. et syph. **43:** 344, 1936. Flandin, C., and Turiaf, J.: Technique et valeur de la réaction de Frei dans la maladie de Nicolas-Favre, Bull. Soc. franç. de dermat. et syph. **43:** 320, 1936.

10. Miyagawa, Y.; Mizamura, T.; Yosi, H.; Ishii, N., and Okanishi, J.: Studies on the Virus of Lymphogranuloma Inguinale Nicolas, Favre and Durand: Cultivation of the Virus on the Chorio-Allantoic Membrane of the Chicken Embryo, Jap. J. Exper. Med. **13:** 733, 1935.

11. Burnet, F. M.: The Use of the Developing Egg in Virus Research, Medical Research Council, Special Report Series, no. 220, London, His Majesty's Stationery Office, 1936.

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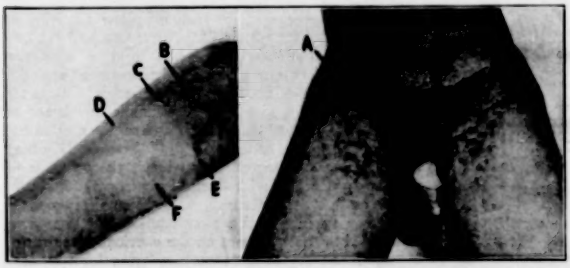
13. Nauck, E. G., and Malamos, B.: Ueber Erregerbefunde bei Lymphogranuloma inguinale, Arch. f. Schiffs- u. Tropen-Hyg. **41:** 537, 1937.

mentioned reports, a relatively low grade infection resulted. More recently Rake, McKee and Shaffer [14] attempted to adapt the virus to the chorioallantoic membrane with the view of increasing its activity. Lesions on the membranes occurred with extreme irregularity, and in no case was the virus lethal for the embryo. The fifth membrane passage showed virus to be present, while none was detectable in subsequent passages. According to these workers, the virus decreased in its virulence for mice or was present in the membranes in low titer. Further attempts to increase the activity of the virus were made by the inoculation of mouse brain virus into the yolk sac of the developing chick.[15] After the fifth serial passage (with material from yolk sacs as the inoculum) the virus readily produced a fatal infection of the developing embryo. In subsequent studies [16] these investigators found that it was not necessary to resort to serial passage to produce a lethal infection of the embryo. Smears made from infected yolk sacs showed numerous granulocorpuscles resembling those described by Miyagawa [17] and Schoen.[18]



Patient with purulent inguinal adenitis and cutaneous reactions (seventy-two hour) to human pus, mouse brain and egg yolk sac Frei antigens (patient 10, table 1). *A*, antigen prepared from pus aspirated from fluctuant right inguinal bubo produced typical Frei reaction in known lymphogranulomatous patients. *B*, reaction to human pus antigen, 6 by 7 mm.; *C*, reaction to mouse brain antigen, 12 by 16 mm.; *D*, reaction to mouse brain control, 3 by 5 mm.; *E*, reaction to egg yolk sac antigen, 8 by 10 mm.; *F*, egg yolk sac control; no reaction. The marital partner of this patient is referred to in table 1 (patient 11).

MATERIALS AND PROCEDURE

The present study was undertaken to establish the value of infected material from egg yolk sacs (lygranum)[19] as a Frei antigen for use in the diagnosis of lymphogranuloma venereum. The specificity and sensitivity of this material was compared with that of mouse brain [20] and human pus antigens. The latter was prepared from pus aspirated from fluctuant unruptured inguinal buboes, according to Frei's [21] technic.

Forty-two patients [22] with active lymphogranulomatous infection or with a history of past infection were tested with the various antigens. A series of intradermal injections was made on the arm, the proximal injection being made with human Frei antigen, two middle injections with egg and mouse brain antigens and two distal injections with the corresponding controls, as is shown in the accompanying illustration. The inoculum consisted of 0.1 cc. of each antigen. Whenever possible the reactions were read within forty-eight to ninety-six hours. Two diameters of the central papule or indurated area were measured with a millimeter scale and recorded. The size of the surrounding erythematous area was not recorded.

A typical positive reaction consists of an elevated reddened central papule which appears within twenty-four to forty-eight hours and is surrounded by an erythematous areola. In the Negro the erythematous halo is not always easily discernible. The papule reaches its maximum size in about three days, gradually decreasing thereafter. In strong reactions the papule may have a vesicular or pustular center. The positive reaction may be discernible for several days and sometimes heals with distinct pigmentation at the area of injection.

Of the 42 persons tested, 40 gave a positive, 1 a doubtful and 1 a negative reaction to yolk sac antigen; 34 gave a positive, 5 a doubtful and 3 a negative reaction to mouse brain antigen and 38 gave positive, 1 a doubtful and 3 a negative reaction to human pus antigen. Thirty-three persons had positive reactions with all three antigens. All doubtful reactions to mouse brain were positive when the egg and human antigens were used. The criteria recommended by Grace [7] were used in interpreting the results. The diameter of a papule indicating the upper limit of a negative reaction was 6 mm., while a papule 7 mm. in diameter or larger was considered indicative of a positive reaction. A reaction to normal mouse brain control material (with the average diameter of the papule about 3.6 mm.) occurred in 29 of these persons, while only 16 reacted to the control yolk sac material (with the average diameter about 2.8 mm.), indicating greater incidence in sensitivity to the former. The results are presented in table 1.

A control group of 20 persons with no evidence of present or past infection were also tested. None of these persons gave evidence of infection, since no cutaneous reactions were produced with a potent, freshly prepared Frei antigen made from human material. Only 2 showed slight (2 to 5 mm.) reactions to human Frei antigen. Every person in this series gave a cutaneous reaction to either mouse brain antigen or control material, although all were below the upper limits of a negative Frei reaction (6 mm.). Three subjects reacted to the lygranum control, while 6 showed a reaction to the antigen, all below 4 mm. in diameter. The results are shown in table 2.

TESTS FOR HYPERSENSITIVITY TO EGG ANTIGEN

It is generally known that any foreign substance when injected intradermally into a human subject will produce an inflammatory response at the site of inoculation. The severity of the reaction will be influenced by any hypersensitivity to the material in the person

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16. Shaffer, M. F.: Personal communication to the authors.
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18. Schoen, R.: Nouvelles données expérimentales sur le virus de la lymphogranulomatose inguinale, Ann. Inst. Pasteur **63**: 260, 1939.
19. "Lygranum" is the name applied by McKee, Rake and Shaffer (Proc. Soc. Exper. Biol. & Med. **44**: 410, 1940) to virus propagated in the yolk sac of the developing chick. Dr. Morris F. Shaffer of the Squibb Institute for Medical Research, New Brunswick, N. J., provided the necessary supply of egg antigen (lygranum) and corresponding control material.
20. The mouse brain antigen was obtained from the Lederle Laboratories, Pearl River, N. Y., through Dr. W. G. Malcolm.
21. Frei, W.: Eine neue Hautreaktion bei "Lymphogranuloma inguinale," Klin. Wchnschr. **4**: 2148, 1925.
22. Dr. Lucius S. Davis of the St. Mary's Infirmary referred patients for study.

inoculated. This must be considered when one interprets the cutaneous response to any Frei "antigen." None of the persons tested in the studies of Grace and Suskind [1] showed natural hypersensitivity to the protein of mouse brain. Only 1 of 65 persons showed acquired hypersensitivity to mouse brain protein after having received nine tests during a seven month period. Of the 42 patients with lymphogranuloma venereum dealt with in table 1, none showed natural hypersensitivity to the egg yolk sac material. Moreover, none of 11 persons in the control group of normal persons retested after two weeks and again after three weeks showed either natural or acquired hypersensitivity to the yolk sac material, probably because the Frei antigen and the corresponding control material as prepared by

TABLE 1.—*Results of Frei Test with Human Pus, Mouse Brain and Egg Antigens in Group of Clinically Lymphogranulomatous Patients and Persons with Past History of Infection*

			Reaction to Frei Test *								
			Human Pus		Mouse Brain			Lygranum (Egg)			
Patient	Sex	Race	Antigen	Interpretation	Control	Antigen	Interpretation	Control	Antigen	Interpretation
1	♀	N	7 × 11	+	3 × 5	12 × 12	+	—	12 × 13	+
2	♀	N	9 × 13	+	3 × 3	13 × 9	+	2 × 4	8 × 15	+
3	♀	N	9 × 9	+	5 × 6	12 × 12	+	3 × 4	7 × 9	+
4	♂	N	7 × 8	+	—	8 × 9	+	—	13 × 15	+
5	♂	N	5 × 8	+	3 × 3	12 × 18	+	—	9 × 10	+
6	♂	W	6 × 8	+	—	9 × 9	+	—	9 × 11	+
7	♂	N	7 × 13	+	—	10 × 17	+	—	8 × 10	+
8	♂	N	8 × 8	+	3 × 4	12 × 12	+	—	10 × 10	+
9	♀	W	2 × 3	—	4 × 5	3 × 6	—	2 × 2	5 × 7	±
10	♀	N	6 × 7	+	3 × 5	12 × 16	+	—	8 × 10	+
11	♀	N	6 × 11	+	3 × 5	12 × 12	+	3 × 4	7 × 9	+
12	♀	N	7 × 7	+	6 × 6	5 × 7	±	—	7 × 8	+
13	♀	N	8 × 12	+	—	9 × 9	+	—	7 × 8	+
14	♀	W	6 × 7	+	5 × 6	6 × 7	±	—	7 × 8	+
15	♀	N	7 × 9	+	4 × 6	12 × 16	+	2 × 3	9 × 11	+
16	♂	W	7 × 8	+	—	9 × 10	+	—	7 × 7	+
17	♂	N	7 × 7	+	2 × 4	9 × 9	+	2 × 3	7 × 8	+
18	♂	N	6 × 9	+	4 × 4	10 × 12	+	3 × 4	6 × 9	+
19	♂	W	6 × 8	+	—	7 × 8	+	—	7 × 7	+
20	♂	N	3 × 3	—	3 × 6	4 × 5	—	—	4 × 7	—
21	♀	N	9 × 12	+	4 × 5	11 × 14	+	2 × 4	7 × 9	+
22	♂	N	7 × 9	+	3 × 3	10 × 13	+	—	8 × 11	+
23	♀	N	8 × 11	+	4 × 4	9 × 11	+	—	7 × 9	+
24	♀	W	5 × 8	+	5 × 6	6 × 8	±	3 × 3	8 × 13	+
25	♂	N	5 × 8	+	—	7 × 7	+	—	6 × 8	+
26	♂	N	7 × 7	+	—	9 × 9	+	—	7 × 9	+
27	♂	N	9 × 10	+	—	7 × 9	+	2 × 3	7 × 8	+
28	♀	N	7 × 8	+	2 × 4	10 × 13	+	3 × 3	9 × 10	+
29	♂	N	6 × 9	+	—	7 × 8	+	—	7 × 7	+
30	♀	W	7 × 9	+	4 × 5	8 × 10	+	—	8 × 8	+
31	♂	N	8 × 8	+	—	9 × 10	+	—	7 × 9	+
32	♂	W	—	—	2 × 4	3 × 3	—	2 × 3	7 × 7	+
33	♀	N	7 × 9	+	3 + 4	9 × 13	+	—	8 × 8	+
34	♀	N	9 × 10	+	—	8 × 8	+	—	8 × 9	+
35	♀	N	5 × 5	+	5 × 5	5 × 8	±	—	6 × 8	+
36	♀	N	6 × 8	+	4 × 5	12 × 14	+	2 × 4	8 × 10	+
37	♂	N	7 × 7	+	—	7 × 7	+	—	7 × 9	+
38	♂	W	8 × 9	+	2 × 3	8 × 10	+	2 × 3	8 × 8	+
39‡	♂	N	7 × 8	+	3 × 4	8 × 9	+	—	7 × 8	+
40‡	♂	N	7 × 9	+	3 × 4	9 × 10	+	—	6 × 8	+
41§	♂	N	6 × 8	+	3 × 5	10 × 10	+	3 × 3	7 × 8	+
42	♀	N	7 × 7	+	2 × 4	11 × 13	+	2 × 3	9 × 12	+

* Size of papule recorded in millimeters; upper limit of papule in negative reaction is 6 mm.; papule in positive reaction is 7 mm. or larger.

† Marital partner of patient 38; no clinical evidence of lymphogranuloma venereum. Patient 38 showed active clinical signs of the disease.

‡ Female impersonator; admits sodomy; superficial perianal granulomatous abscesses; negative cutaneous reaction with Haemophilus of Ducrey; positive Kahn reaction.

§ Female impersonator; admits sodomy; history of lymphogranuloma venereum; negative cutaneous reaction with Haemophilus of Ducrey; positive Kahn reaction.

Rake, McKee and Shaffer [14] is relatively free from the constituents of yolk sac. No attempts were made to ascertain whether sensitization to the virus occurs.

COMMENT

Antigen prepared from the yolk sac of the developing chick embryo infected with the virus of lymphogranuloma venereum can replace that prepared from infected mouse brain or from human pus for performing the Frei cutaneous test. That yolk sac antigen (lygranum) is superior to mouse brain antigen in sensitivity and specificity is evident from an analysis of the results obtained in 42 patients with lymphogranuloma venereum and 20 nonlymphogranulomatous persons. In

TABLE 2.—*Results of Frei Test with Human Pus, Mouse Brain and Egg Antigens in Group of Nonlymphogranulomatous Persons*

			Frei Test						
			Human Pus	Mouse Brain			Lygranum (Egg)		
Patient	Sex	Race	Antigen	Interpretation	Control	Antigen	Interpretation	Control	Antigen	Interpretation
1	♀	N	—	—	3 × 4	3 × 6	—	—	3 × 4	—
2	♂	W	—	—	2 × 2	2 × 3	—	—	—	
3	♂	N	—	—	4 × 5	2 × 4	—	—	2 × 3	—
4	♀	N	—	—	3 × 4	4 × 5	—	—	—	—
5	♀	W	—	—	—	2 × 3	—	—	—	—
6	♀	N	2 × 5	—	3 × 3	4 × 5	—	2 × 4	3 × 3	—
7	♀	N	—	—	3 × 4	3 × 5	—	—	—	—
8	♀	W	—	—	2 × 3	2 × 4	—	—	—	—
9	♂	N	—	—	3 × 4	4 × 4	—	—	—	—
10	♂	N	—	—	3 × 3	3 × 4	—	—	—	—
11	♀	N	—	—	2 × 3	3 × 4	—	—	3 × 3	—
12	♀	N	—	—	—	2 × 3	—	—	—	—
13	♀	W	—	—	2 × 3	2 × 4	—	—	—	—
14	♀	N	—	—	3 × 3	4 × 4	—	3 × 3	3 × 5	—
15	♀	N	—	—	3 × 3	2 × 4	—	—	—	—
16	♀	W	—	—	3 × 4	3 × 5	—	—	—	—
17	♀	N	—	—	3 × 4	3 × 3	—	—	—	—
18	♀	N	2 × 3	—	3 × 5	3 × 3	—	3 × 3	3 × 4	—
19	♀	N	—	—	2 × 3	2 × 4	—	—	—	—
20	♀	N	—	—	3 × 3	2 × 3	—	—	—	—

5, or 11.9 per cent, of the cases of lymphogranuloma venereum, the papules appearing in reaction to control mouse brain material were 5 mm. or more in diameter and were indistinguishable from those seen in positive Frei reactions. In each of these cases a positive diagnosis could be made with the yolk sac antigen or with the material from human pus. Throughout the investigation the reactions to mouse brain were invariably more intense than those resulting from human pus or yolk sac material. The average diameter of the papule in a positive reaction to mouse brain antigen and to control material was 10.7 mm. and 3.6 mm., respectively, while positive reactions to yolk sac antigen and control material were 9.5 mm. and 2.8 mm., respectively. Nonspecific papules were produced in 29 of the 42 lymphogranulomatous persons receiving control mouse brain material, while only 16 patients showed reactions to the lygranum control material.

The experience with the new antigen (lygranum) prepared from the infected yolk sac of the developing chick embryo presented in this report substantiates the recently reported observations of Grace, Rake and Shaffer.[23]

CONCLUSIONS

1. Yolk sac antigen (lygranum) is superior to mouse brain antigen for performance of the Frei cutaneous test for lymphogranuloma venereum.

2. Comparatively few nonspecific reactions are produced with the egg control material as compared with the mouse brain control.

3. The most satisfactory confirmatory procedure for the diagnosis of lymphogranuloma venereum is the Frei cutaneous test with yolk sac antigen (lygranum).

3 Municipal Courts Building.

23. Grace, A. W.; Rake, Geoffrey, and Shaffer, M. F.: A New Material (Lygranum) for Performance of the Frei Test for Lymphogranuloma Venereum, Proc. Soc. Exper. Biol. & Med. 45:259, 1940.

TREATMENT OF MENINGOCOCCIC MENINGITIS AND MENINGOCOCCEMIA WITH SULFADIAZINE

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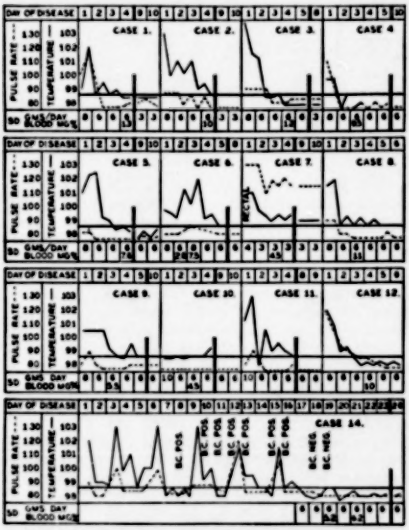
In August 1940 the city of Halifax, Nova Scotia, experienced the beginning of an epidemic of meningococcic meningitis which gradually increased in intensity during the next six months, reaching an apparent peak of case incidence during January and February 1941. The total number of hospitalized patients during this period was 93, of whom 82 were treated with sulfapyridine. The cases of 20 of these patients have been reported by Black and MacKenzie [1] and by Reid and Turner.[2] Seven deaths occurred in the entire sulfapyridine-treated group: 1 of the deaths was of a patient with diabetic acidosis, 3 occurred shortly after admission, and 1 was attributed to obstructive hydrocephalus which appeared as a late complication. In the other 2 cases the disease progressed without complications but terminated fatally in spite of sulfapyridine and specific serotherapy.



Clinical course in 13 cases of meningococcic infection. *SD* = sulfadiazine; *B.C.* = blood culture. Cases 1 to 12, meningococcic meningitis; case 14, meningococcemia with arthritis.

The opportunity to study this disease at the peak of the epidemic arose during a survey of epidemic infectious diseases undertaken by a group from Harvard Medical School, headed by Dr. J. Howard Mueller. The survey was conducted with the consent and cooperation of the health and medical authorities of Halifax. At that time the use of sulfadiazine for various infectious diseases [3] was being studied in the Boston City Hospital. Preliminary observations had indicated that sulfadiazine was considerably less toxic than other sulfonamide drugs and that it was effective in endemic meningococcic infections. Permission to extend these observations to epidemic meningitis was granted by the Office of Public Health and Welfare of Halifax.[4]

In this paper are included 11 consecutive patients admitted to the Infectious Disease Hospital of Halifax from the latter part of January through February. These patients were treated with sulfadiazine, and all recovered. Also included here are 3 patients with sporadic meningococcic infection treated with sulfadiazine at the Boston City Hospital. Two of these patients had meningitis and 1 had meningococcemia and arthritis without evidence of meningeal involvement. One of the patients with endemic meningitis died.

CLINICAL ASPECTS

The relevant data concerning the individual patients are recorded in the accompanying table. One of the patients (case 7) was 2 years old; the others were adolescents and adults ranging in age from 14 to 60. The duration of illness before treatment varied from five hours to six days, with the exception of that of the patient with meningococcemia (case 14) in which twenty-three days elapsed before chemotherapy. The majority of the patients presented the typical picture of meningitis on admission. The onset was sudden with malaise, followed rapidly by headache, stiff neck, nausea and vomiting. The individual patients showed considerable variation in the severity of illness. All except 1 (case 10) had an elevated temperature either at the time of admission or within a few hours thereafter.

BACTERIOLOGIC STUDIES

Initial lumbar puncture in the 13 cases of meningitis revealed turbid fluid under increased pressure. The diagnosis was confirmed bacteriologically [5] in all cases but 1 (case 5), in which fluid was obtained five hours after onset. Stained smears of the cerebrospinal fluids revealed gram-negative intracellular diplococci in 9. Meningococci were grown from the fluids in 9 of the 12 cases in which cultures were taken. Blood cultures were made in 12 cases, but meningococci were found in only 1.

Nasopharyngeal cultures were taken in 8 cases, of which 5 were positive for meningococci. Repeated swabs in 3 of these cases were negative by the second or third day of treatment and remained negative. In 1 instance, culture was negative on admission, positive on the second day of chemotherapy and negative there-

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From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Departments of Medicine and of Bacteriology and Immunology, Harvard Medical School, and from the Office of Public Health and Welfare, Halifax, N. S.

1. Black, G. A., and MacKenzie, K. A.: Report of Seventeen Cases of Cerebrospinal Meningitis, with Special Reference to Treatment, Nova Scotia M. Bull. **20**: 19, 1941.
2. Reid, J. W., and Turner, G. W.: Sulfapyridine in Cerebrospinal Meningitis, Nova Scotia M. Bull. **20**: 26, 1941.
3. Finland, Maxwell; Strauss, Elias, and Peterson, Osler: Sulfadiazine: Evaluation of Its Therapeutic and Toxic Effects in Four Hundred and Forty Six Patients, J. A. M. A., this issue, p. 2641.
4. Dr. D. J. MacKenzie, director of the Provincial Public Health Laboratory, Mr. Henry Ross and the staff of the Infectious Disease Hospital also gave their assistance. The sulfadiazine and the serums for meningococcic typing used in this study were supplied by Lederle Laboratories, Inc.
5. The isolation of these strains was accomplished by Dr. J. Howard Mueller and his associates on a casein hydrolysate-starch agar medium (Mueller, J. H., and Hinton, J.: Personal communication to the authors).

after. Para-amino-benzoic acid was employed as an inhibitive agent in all cultures taken after chemotherapy was instituted.[6]

The epidemic strains of meningococcus were determined to be type I, both by agglutination and by the quellung reaction.[7] The strains in the 3 Boston cases did not give a quellung reaction, but Dr. Sara E. Branham of the National Institute of Health identified two of them as type II by agglutination. The biologic properties of these strains will be reported elsewhere.

METHOD OF TREATMENT

The same general plan of treatment was followed in all cases. Four Gm. of sulfadiazine was administered orally in the first four hours, followed by 1 Gm. every four hours. Patients unable to take oral medication were given the same doses of sodium sulfadiazine in physiologic solution of sodium chloride intravenously. In cases 10 and 11, oral therapy was supplemented by simultaneous administration of 2 Gm. of sodium sulfadiazine, either intravenously or intramuscularly. Blood levels[8] of free and total sulfadiazine were determined between the third and the sixth day. The values obtained are charted. Chemotherapy was continued for a period of six to eleven days.

Supportive therapy was employed as indicated. No antimeningococcic serum or specific agents other than sulfadiazine were employed. Fluids were administered orally or parenterally in amounts sufficient to permit excretion of approximately 1,500 cc. of urine daily.

Diagnostic lumbar puncture was performed on admission, but the procedure was repeated only for definite indications such as signs of increased intracranial pressure or failure of response to therapy.

*Summary of Fourteen Cases of Meningococcic Infection with Sulfadiazine Therapy**

			Clinical Features on Admission									Initial Cerebrospinal Fluid				Sulfadiazine Therapy				Course; Day of Treatment		
Case Number	Sex	Age	Duration, Days	Headache	Stiff Neck	Vomiting	Drowsiness	Delirium	Coma	Petechiae	Herpes	Severity †	Turbidity	Smear	Culture	Blood Culture	Nasopharyngeal Culture	Type of Meningococcus	Route of Administration	Total Dose, Gm.	Duration, Days	Toxic Effects	Temperature Lower; Clinically Improved	Afebrile	Complete Symptomatic Recovery
1	♀	19	1	+	+	+	+	0	0	0	0	++	++	+	+	0	+	I	Oral	56	10	None	2	4	5
2	♂	45	5	+	+	+	0	0	0	0	+	+	++	+	+	0	+	I	Oral	56	10	None	2	4	5
3	♀	21	2	+	+	0	+	0	0	0	+	++	++	+	0	0	0	—	Oral	53	8	Ureteral pain; microscopic hematuria, crystals in urine 8th day	3	3	4-5
4	♂	21	2	+	+	+	0	0	0	0	0	+	++	+	0	0	+	I	Oral	62	10	None	2	2	4-5
5	♂	37	5 hrs.	+	+	+	+	+	0	+	+	+++	++	0	0	0	0	—	Intravenous, oral	62	10	None	3	3	4-5
6	♂	24	2	+	+	+	+	0	0	+	+	++	++	+	+	0	+	I	Oral, intravenous	58	10	None	4	5	6
7	♂	2	2	..	+	+	+	+	0	+	0	+++	++	+	+	0	0	I	Oral	31	10	None	3	3	4
8	♂	60	6	+	+	+	0	0	0	0	0	+	++	+	+	0	+	I	Oral	56	10	None	2	5	5
9	♂	14	12 hrs.	+	+	+	+	+	+	+	+	+++	++	0	+	+	—	I	Inirs-venous, intramuscular, oral	62	10	None	3	5	5
10	♂	21	2	+	+	+	0	0	0	0	0	+	++	+	+	0	—	I	Intravenous, oral	58	10	None	2	..	5
11	♂	22	1	+	+	+	0	0	0	0	+	+	++	+	—	—	—	—	Intravenous, oral	79	13	None	2	4	5
12‡	♀	24	4	+	+	+	0	0	0	0	0	+	++	0	+	0	—	..	Oral	36	6	Flank pain; microscopic hematuria 8th day; no crystals in urine	3	3	5
13	♂	47	?	Admitted in deep coma.....								+	0	+	—	—	II	Oral (stomach tube)	7	1	.....	Died in 10 hours		
14	♂	24	6	Fever, arthritis and malaise; palpable spleen; no petechiae; no meningitis								0	0	0	+	—	II	Oral	54	10	None	1	1	5-6

* + = positive or present; 0 = negative or absent; — = not done.

† Severity of illness: +++ = severely ill, coma or extreme prostration; ++ = acutely ill, delirium or drowsiness, moderate prostration; + = acutely ill, rational.

‡ Primipara; pregnant 8 months; pregnancy unaffected.

RESULTS

The general course of each patient may be seen in the last three columns of the table and in the temperature records reproduced here. In 11 of the patients with meningitis considerable clinical improvement was apparent on the second or third day of chemotherapy, as indicated by relief of malaise and headache and return of appetite. Temperature responses of most patients were prompt and occurred simultaneously with the sub-

6. Strauss, Elias; Lowell, F. C., and Finland, Maxwell: Observations on the Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid, J. Clin. Investigation **20:** 189 (March) 1941. Janeway, C. A.: Method for Obtaining Rapid Bacterial Growth in Cultures from Patients Under Treatment with Sulfonamides, J. A. M. A. **116:** 941 (March 8) 1941.

7. Clapp, F. L.; Phillips, S. W., and Stahl, H. J.: Quantitative Use of Neufeld Reaction with Special Reference to Titration of Type II Antipneumococcic Horse Sera, Proc. Soc. Exper. Biol. & Med. **33:** 302 (Nov.) 1935.

8. These determinations were performed by Miss Helen Robertson in the Chemical Laboratory of the Department of Pathology, Dalhousie University Faculty of Medicine, through the kindness of Dr. R. P. Smith. The method of Bratton and Marshall (A New Coupling Component for Sulfanilamide Determination, J. Biol. Chem. **128:** 537 [May] 1939) was used.

jective improvement. One patient with meningitis (case 6) showed no apparent response to chemotherapy during the first three days. On the third day the free sulfadiazine level was only 2.6 mg. per hundred cubic centimeters of blood. He was given 2 Gm. of sodium sulfadiazine intravenously in addition to the usual oral dose; on the following day the blood level was 7.5 mg. (free) and symptomatic improvement had begun. Another patient (case 12), a primipara in the eighth month of pregnancy, made an uneventful recovery and was delivered at term of a normal infant. The 12 patients with meningitis who recovered became free of symptoms after an average period of five days. There were no recurrences, and recovery was complete without residuals. One patient in the Boston group (case 13) died ten hours after admission and received only 7 Gm. of sulfadiazine. The blood sulfadiazine level shortly before death was low (2.8 mg., free and total), and the cerebrospinal fluid showed only a slight trace of the drug. Attempts to culture meningococci from material obtained at autopsy, however, were unsuccessful.

The patient with meningococcemia was a man aged 24, an Italian, who had been ill with fever and joint pains for six days before entry. There was no history of gonorrhea and he stated that he had not been exposed to it. The right elbow and right ankle were tender but not hot or swollen. Repeated blood cultures were positive for gram-negative diplococci which were identified as meningococci. Repeated complement fixation tests and prostatic smears and cultures were negative for gonococci. There was no evidence of endocarditis. Recovery was prompt on administration of sulfadiazine; the temperature remained normal, and all blood cultures made following chemotherapy were sterile.

Complications which probably were attributable to sulfadiazine were encountered in 2 cases. In 1 of these (case 3) pain of right ureteral distribution developed on the eighth day of chemotherapy. The pain lasted several hours. Urine voided at this time showed from 10 to 15 red blood cells per high power field and numerous sulfadiazine crystals in uncentrifuged specimens. In the other (case 12) pain in the right flank associated with microscopic hematuria developed on the eighth day, but no sulfadiazine crystals were found. The urine in both cases cleared rapidly after cessation of chemotherapy. Nausea, vomiting, dermatitis, cyanosis or mental symptoms attributable to the drug were not present.

An adequate statistical comparison of the therapeutic efficacy of sulfapyridine and sulfadiazine cannot be made from these data. Clinical impressions indicated that the two drugs were about equally effective against the meningococcus. Sulfadiazine had the advantage of being considerably less toxic.

SUMMARY

Sulfadiazine has been employed as the sole specific agent in the treatment of 13 patients with meningococcic meningitis and 1 with meningococcemia with arthritis but without meningitis. One patient with meningitis died ten hours after admission. The remaining 13 patients recovered promptly and completely.

Glycogen Storage.—About 500 Gm. of glycogen are, on an average, stored in the body, about 100 Gm. in the liver, and practically all the rest in the skeletal muscles.—Wright, Samson: Applied Physiology, New York, Oxford University Press, 1940.

Clinical Notes, Suggestions and New Instruments

PERFORATION OF UTERUS BY HYDATIDIFORM MOLE

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Since perforation of the uterus by a hydatidiform mole is an extremely rare condition, it is felt that the presentation of the following account is justified.

In both Lord's [1] case in 1868 and Seitz's [1] in 1904 the outcome was fatal. Then followed a series of cases in which treatment by supracervical hysterectomy was successful. One was reported each by Waldo [2] in 1910, Harkness [1] in 1921, Krellenstein [3] in 1924, Mazet [4] in 1926 and Kallinikoff [5] in 1928. Kallinikoff's patient was a multipara under the age of 25, as was Johannson's [6] patient in 1929, who died after hysterectomy. Bland's [7] patient in 1927, a nullipara aged 30, died fourteen months after the original operation following exploration of a recurrent choriocpithelioma. The first operation was performed at a time when the hydatid mole was undergoing malignant change. Gizowski [8] reported another patient with such a uterine perforation in 1934, and McClure [9] in 1935 added an account of a woman aged 24 who was operated on with a diagnosis of ectopic pregnancy and who recovered after a blood transfusion and panhysterectomy. So far as I can tell the twelfth case to be reported was that of Conway [10] in 1938, in which the patient was a septipara aged 51 who died with Clostridium welchii peritonitis. If the figures are correct, our case is the thirteenth.

It was my privilege recently to consult with and to assist Dr. K. C. Chock in the following case, which had all the earmarks of a ruptured tubal gestation with peritoneal inundation. The case is presented with Dr. Chock's permission.

REPORT OF CASE

L. M., a Hawaiian woman aged 44, was admitted to the surgical service of the Queen's Hospital on Aug. 18, 1940 with complaints of severe, diffuse pain in the lower part of the abdomen and vaginal bleeding. She flatly denied having made any attempts to induce abortion. A persistent, painless dripping of bloody fluid from the vagina had begun on June 11 and had persisted intermittently to the time of admission to the hospital. At noon, on the date of admission, the patient was seized with agonizing pain in the left lower quadrant of the abdomen. She was seen shortly after the onset and was pale and in obvious shock. At this time an indefinite mass could be felt in the lower part of the abdomen mostly to the left of the midline. Tenderness gradually shifted to the right lower quadrant of the abdomen as well, and on admission, five hours after onset of the pain, the tenderness was diffuse and agonizing.

The past history was chiefly one of a succession of pregnancies and was otherwise essentially negative. This was the patient's sixteenth pregnancy. There were eight living children and there had been two stillborn. The other pregnancies had terminated in early spontaneous abortion. The menses had been regular and painless from the time of her last delivery three years and seven months prior to the present admission to the hospital except for amenorrhea of eleven months' duration. At her last labor she had been delivered of stillborn 8 month macerated twins weighing 5 pounds 4 ounces (2,381 Gm.) and

From The Clinic.

1. Cited by Krellenstein.[3]
2. Waldo, R.: Results at Lebanon Hospital of Deferred Operations for Extrauterine Pregnancy, Am. J. Obst. **62**: 863, 1910.
3. Krellenstein, J. B.: Hydatid Mole with Spontaneous Rupture of Uterus, Am. J. Obst. & Gynec. **8**: 636, 1924.
4. Mazet: Perforation utérine par môle hydatidiforme, Lyon méd. **137**: 336, 1926.
5. Kallinikoff, J. I.: Ein Fall von Mola hydatidosa. Perforatio Uteri, Amputatio Uteri supravaginalis, Monatschr. f. Geburtsh. u. Gynäk. **78**: 181, 1928.
6. Johannson, J.: Mola hydatidosa destruens, Acta obst. et gynec. Scandinav. **8**: 131, 1929.
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4 pounds 10 ounces (2,098 Gm.) respectively. The cause of the fetal deaths was obscure. The Wassermann and Kahn reactions of the blood were negative.

Physical examination revealed that the patient was obese and was in shock, with a pale gray face, a feeble, rapid pulse and clamminess of the extremities. Her underwear was soaked with bright red blood, and she complained of agonizing generalized abdominal pain. The temperature was 97 F., the pulse rate 120, the respiratory rate 24 and the blood pressure 68 systolic and 50 diastolic (?). There was exquisite tenderness of the entire abdomen and dulness of the flanks on both sides, although the patient's condition was too poor to warrant testing for shifting dulness. A wave of fluid was elicited, and a large tender mass the size of a grapefruit was felt in the midabdomen, rising up and out of the pelvis. On pelvic examination the cervix was noted to be soft, and there was exquisite tenderness of the cul-de-sac with the feel of a downward bulge caused by collected fluid. The diagnosis on admission was ruptured ectopic pregnancy or ruptured ovarian cyst.

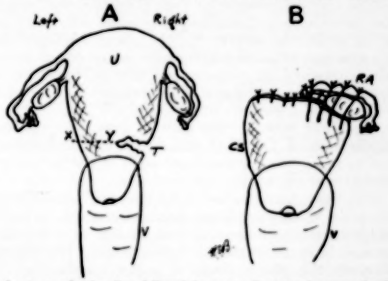
Laboratory Data.—On admission the red blood cell count was 3,000,000 and the white blood cell count 32,000, with 90 per cent neutrophils and 10 per cent lymphocytes. A donor whose blood was compatible was found, and a transfusion of 550 cc. of citrated blood was given by the indirect method before operation and again immediately after operation.

Operation.—As soon as the patient's condition improved after the initial transfusion, the abdomen was opened through an incision along the midline. Anesthesia with nitrous oxide and ether was given. Approximately 1,000 cc. of blood and blood clots was found and most of it removed by aspiration and by mopping with gauze tapes. During the process a firm mass of tissue the size of a lemon and yellowish red was lifted out of the cul-de-sac. This was quickly incised with a scalpel and was seen to contain many cystic tumors of varying size suggesting a typical hydatid mole. The uterus was inspected next. Its size was approximately that of a three months pregnant uterus. To our dismay a ragged, 4 cm. rent was found on the posterolateral surface of the uterus, as shown in figure 1 *A*. This rent was plugged with firm blood clots when seen. It admitted three fingers easily. The uterus was removed, the incision being carried around from the end of the tear. The adnexa on each side were normal in appearance except for congestion. The left fallopian tube and ovary were removed with the uterine body but the right adnexa were retained and were used as a tampon to plug the rent. The tissues here were friable, and sutures cut through until we drew the right adnexa pedicle down as a stopgap (fig. 1 *B*).

The incision was closed in layers without drainage, and the second transfusion of 550 cc. of citrated blood (making a total of 1,100 cc.) was given. The patient's condition was much improved at the close of the operation.

Pathologic Report.—Gross: The specimen consisted of a uterus and a mass of yellowish red tissue measuring 13 by 8 by 6 cm. The surface was irregular, roughened and friable, with adherent blood clots. Sections showed reddish gray friable tissue with areas of hyaline substance almost cartilaginous in consistency. There were a number of spaces lined by a grayish membrane approximately 1 mm. thick, containing clear fluid. The largest cavity measured 1.5 cm. in diameter. An area of brownish red friable tissue was noted at one side extending into the substance of the mass, resembling blood clots. The uterus measured 12 by 11 by 6 cm. The serosal surface was smooth and yellowish pink, with several areas of recent hemorrhage. The right fallopian tube and ovary were attached. The entire cervix was not included. The area of attachment measured 8 by 7 cm. and was rough and severely hemorrhagic. Sections showed yellowish pink myometrium with prominent vessels. The wall measured 3 cm. and had loosely adherent bits of dark reddish gray, friable tissue on the posterior surface. The tissue near the site of removal was dark red and hemorrhagic, with adherent portions of blood clots. The ovary measured 3 by 1.5 by 0.8 cm. The surface was slightly roughened and hemorrhagic. Sections showed grayish stroma with an occasional small cyst. The fallopian tube measured 7.5 by 0.5 cm. The fimbriae were free and the surface of the ostium was smooth. Sections showed no gross abnormalities. A nodule 2 by 1 by 1 cm. was noted at the base of the mesovarium medially which on section showed connection with ovarian substance. The mass consisted of a solid area of yellowish, slightly translucent tissue. There were nine sections.

Microscopic: Sections of the fallopian tube showed thickened, edematous plicas and a wall infiltrated by scattered acute inflammatory cells. The epithelium appeared intact. The lumen contained irregular groups of mononuclear and polymorphonuclear cells and areas of serum. Sections of the ovary showed a large mass of moderately degenerated corpus luteum cells with a central area of pigment and relatively loose fibroblastic tissue. The corpus luteum resembled that seen in pregnancy. Sections of myometrium showed large muscle cells, many congested vascular spaces and scattered groups of mononuclear cells. The vascular spaces just beneath the endometrium were large. The endometrial layer was moderately thick and irregular, with decidual reaction and scattered groups of chronic inflammatory cells. This area was vascular also. Glands present were in the late luteum phase. No placental tissue was identified in relation to the endometrial layer. Other sections of myometrium and endometrium showed a similar picture. There was no evidence of a neoplasm. No cervical tissue was identified. A few areas of myometrium showed apparent necrosis of tissue with groups of acute inflammatory cells and blood cells. The vessels appeared normal. Other sections showed groups of large, irregular structures with delicate central network containing spindle cells of the adult Langhans type and a surrounding darkly staining



A, uterus, showing line followed by rent. *B*, sutured stump showing how right adnexa were used. *U* = uterus; *T* = tear; *XY* = line along which remainder of stump was amputated; *V* = vagina; *CS* = cervical stump; *RA* = right adnexa.

syncytial layer resembling placental villi. Many of the structures were larger than normal placental villi. None appeared definitely cystic. The syncytial cells were occasionally seen in small groups along the edge of the villous structures without evidence of invasion or malignant action. Certain areas of this tissue were hyaline with complete loss of cellular detail. Other areas showed myxomatous trabeculated tissue approaching a cystic character.

Diagnosis.—The patient's condition was diagnosed as (1) a hydatid tumor, with (2) decidual reaction, (3) corpus luteum of pregnancy (?), (4) chronic endometritis, (5) chronic metritis and (6) acute salpingitis.

Subsequent Course.—A third transfusion of blood (500 cc.) was given on the day after operation, without untoward results. The patient left the hospital in good general condition twenty-eight days after operation. There was some infection of the wound, and healing occurred by granulation. On discharge, however, the incision was firm. The red blood cell count at this time was 4,670,000, with 80 per cent hemoglobin.

To date the condition of the patient has been satisfactory, and she now attends to her daily duties as a housewife and mother. Friedman tests have continued to give negative results.

SUMMARY

1. Spontaneous perforation of the uterus by a hydatid mole has been reported twelve times in the literature available to us. The case reported here is the thirteenth.

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Special Articles

LEGAL RESPONSIBILITY FOR MEDICAL MALPRACTICE

IV. MALPRACTICE CLAIMS IN THE UNITED STATES AND A PROPOSED FORMULA FOR TESTING THEIR LEGAL SUFFICIENCY

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This is the fourth of a series of six articles on "Legal Responsibility for Medical Malpractice." The three previous articles were published in The Journal March 8, May 10 and May 31, respectively.

This study has ranged widely; I shall now narrow its orbit and focus sharply on the American scene. The first case of malpractice to be carried to an American court of appeal, so far as I can discover, was that of *Cross* v. *Guthery*, decided by the Supreme Court of Errors of Connecticut in 1794 (2 Root 90, 1 Am. Dec. 61).

The plaintiff brought an "action on the case" against the defendant, a "practicing physician who professed to be skilled in surgery." The plaintiff alleged that his wife had a "scrofulous humor" in one of her breasts which required its removal and that he employed the defendant, who performed the operation "in so unskillful and cruel a manner, that the plaintiff's wife survived by but three hours." The plaintiff prayed for damages in the sum of £1,000 to cover his costs and expense and to repay him for the deprivation of the service and company of his wife.

The defendant pleaded a compromise, alleging that the plaintiff had previously relinquished any claim for malpractice in exchange for cancellation of a £15 book account incurred in the wife's treatment. The plaintiff traversed this plea by denial of such a compromise. On offer of proof, the jury found that no such compromise had been agreed on and returned a verdict in the plaintiff's favor for £40 damages and costs. One reads:

> Defendant moved in arrest of judgment on the ground that the offense charged appeared to be a felony, and by the laws of England, the private injury was merged in the public offense.

The Supreme Court said:

> The declaration is sufficient. The rule urged by the defendant is applicable, in England, only to capital crimes, where, from necessity, the offender must go unpunished, or the injured individual go unredressed.

The peculiar ground on which the decision is based is explained by the fact that the defendant had placed his sole reliance on the alleged compromise. When the jury found against him on this question of fact, he seized on the foregoing ingenious but far fetched contention as the only prospect for reversal. It should not be thought that the court supposed the plaintiff's right rested on the necessary proof of a crime. It was simply using a ready answer to dispose of the narrow contention presented by the appeal. The "record" did not require any discourse on legal responsibility for medical malpractice. That the court did not intend to imply that civil responsibility exists only when the mala praxis amounts to a misdemeanor or a crime is shown by its later opinion, in 1812, in the case of *Grannis* v. *Branden* (5 Day 260, 5 Am. Dec. 143). In this case the Connecticut Supreme Court of Errors upheld a judgment against a physician based on alleged negligent conduct of a child birth. It rested its decision exclusively on the civil law of negligence, being of opinion that the facts showed both negligent omission (nonfeasance) and negligent commission (misfeasance). The first consisted of the physician's failure to give proper care to the expectant mother for two days preceding the birth; the latter consisted of affirmative unskilful acts in procuring delivery, with resultant wounding of both mother and child.

Much is heard and said about the peril of malpractice claims, but there is a definite lack of accurate information by which one might appraise the reality and the size of this hazard. It would be instructive to know in what states the problem is most acute. In an effort to replace surmise by a more factual appraisal, I have undertaken to collect all the civil malpractice appeal cases decided by American courts from 1794 to Jan. 1, 1940.[1] These have been arranged in tabular form to facilitate comparison. The information raises some challenging inquiries and affords more points of discussion than can be pursued in this paper. I found, among other things, that:

1. A total of 1,513 appeal cases came before American courts between 1794 (first case, *Cross* v. *Guthery*) and Jan. 1, 1940. These, as preserved precedents, constitute the American common law controlling civil responsibility for medical malpractice.

2. Up to 1860, when the outbreak of the Civil War occurred, there had been only 23 appeal cases; by 1900 the total had risen to 217 and by 1940 to 1,513.

3. There has been a vast increase in these cases since 1900, and, as the chart shows, the percentage increase of this malpractice litigation for ten year periods up to 1940 far outstripped the percentage increase in the number of physicians or in the population. Other factors must account for the remarkable rise.

4. Of the 1,513 cases, decisions in only 15 were handed down by the federal courts. This is explained by the fact that only infrequently is there a basis for federal jurisdiction. Since malpractice jurisprudence rests on common law and involves no federal question, the sole basis on which a federal court might assume jurisdiction is diversity of citizenship. When the plaintiff and the defendant are citizens of different states and the amount in controversy is $3,000 or more, exclusive of costs and interest, the plaintiff may sue in the federal court, or defendant by proper removal proceedings, timely filed, may remove the case from the state to the federal court at his election (United States judicial code, title 28, section 41). Thus, the only occasions when malpractice cases are apt to be encountered in the federal courts are when a patient from one state has placed himself under the treatment of a physician who is a citizen of a sister state.

5. There is a distinct correlation of the increase in cases of malpractice with the increase in urbanization. The incidence of malpractice cases seems to be higher in metropolitan centers than in small towns.

6. Cases of fracture constitute the most important single type of case. Claims arising out of the nonuse or the negligent use of roentgen rays form another

1. Because of the vast growth of American common law precedents, with more than 1,000,000 appeal cases since 1900, even careful research is not a guarantee that one has located all the authorities. I believe, however, that the table is correct, within a small range of error, and I am sure that any mistake is in the direction of understatement. Only civil actions against physicians and surgeons for alleged malpractice are included; similar actions against hospitals or nurses are excluded, as are prosecutions for alleged criminal malpractice and proceedings under medical practice acts.

large group of cases. Obstetric cases form an important group, and surgical cases constitute a fourth group of considerable size.

7. The majority of cases are based on alleged dereliction of the physician himself rather than on the negligence of his agent or employee.

8. Only occasional cases are against "quacks" or rest on ignorance or alleged lack of qualification. The great majority are against qualified physicians for failure to use average "due care" or "skill" in the particular transaction.

Increasingly, failure to possess or to exercise due skill, rather than lack of care, is becoming the basis of complaint.

In the tables the figures showing the total number of cases per state should be of particular interest to lawyers or to those interested in seeing what states are contributing the most law to the jurisprudence of malpractice. Individual physicians will be more keenly interested in examining the columns which show the incidence of malpractice appeal cases per million of population and per physician. The tables were designed to permit study of judicial evolution and to make possible certain statistical interpretations. In making calculations of rates, population figures were taken from the records of the United States Bureau of the Census; the figures for the number of physicians per state are census figures of the American Medical Association, and the incidence of malpractice cases per state was determined by my own legal researches.

To just what extent does the number of appeal cases represent a reliable index of the magnitude of the malpractice problem and the size of the risk to the average physician in a particular state? A moment's reflection will show that only cases which involve a substantial "stake" are apt to go to the appeal courts: it is not economically worth while to appeal a controversy in which the attorney's fee and the costs will exceed the amount in dispute. Appeal cases, both theoretically and actually, represent judgments ranging from $1,000 to $50,000 and are the malpractice claims apt to prove damaging or financially ruinous to the physician. They usually represent cases in which the patient has suffered a grave or disabling injury.

Lawyers know that cases in this group are, for the most part, fought to the courts of last resort, since the large damages sought militate against a compromise if there is even a faint hope of reversal. Defendants also recognize that a period ranging from several months to two years may expire before the highest courts of a particular state dispose of the appeal. During this time a plaintiff can get very hungry and may prove open to a compromise calling for much less money than the judgment. Thus, not only sharp differences on points of law but cogent practical reasons have a bearing on the number of trial court judgments carried to a higher court by appeal.

What were the chances in the ten year period from 1930 to 1940 that an average physician in a given state actually ran of finding himself in an appeal court as a party litigant to a malpractice controversy of substantial magnitude?[2] In North Dakota, the state with the highest incidence of cases per physician, the rate was 0.015, and hence the chances were 15 in 1,000 for the ten year period and 1.5 in 1,000 for each year. In North Carolina, the chances for the whole ten year period were 7 in 1,000; in Colorado, 4.1 in 1,000; in Texas, 2.6 in 1,000; in Massachusetts, 2.4 in 1,000; in New Jersey, 2.1 in 1,000; in New York, 1.3 in 1,000; in Pennsylvania, 1 in 1,000, and in Nevada and New Mexico the risk was 0. To find the "chance" per year, each of these figures must be divided by 10. Calculations for each state can be made from the tables. It appears that for the physician not engaged in work with fractures, in the practice of surgery or obstetrics or in the use of the roentgen ray for diagnosis or for therapy the actual risk was much below this crude rate. Such a physician, handling a select practice, with few itinerant, transient or recognizable "trouble-making" patients, and armed with a reasonable knowledge of his legal position and accustomed to keeping good records and observing certain medicolegal precautions, may justly expect a lower insurance rate conformable to his status as a preferred risk and also may be influenced by these considerations in arriving at the amount of malpractice insurance he will carry.

It is evident that cases decided by appellate courts represent only a fraction of the complaints of negligent practice; they form the apex of a pyramid of which the parts may be represented thus:

(1)—(Apex of the pyramid): Cases actually carried to an appeal court (Table 1 has figures for each state)
(2)—(Multiply (1) by 3): Cases disposed of on judgment of the trial court, by payment or by compromise, without appeal
(3)—(Multiply (1) by 9): Claims compromised or abandoned after a suit was filed but before trial
(4)—(Multiply (1) by 20): Claims compromised by payment of money before any suit was filed
(5)—(Multiply (1) by 100): Claims in which action against the physician was considered, but the patient was dissuaded, without payment of money or cancellation of bill, or he abandoned the claim voluntarily
(6)—(Multiply (1) by 1,000): Instances in which the physician had been negligent in fact or in the patient's opinion, but no consequence ensued except, perhaps, a loss of good will or a change of patronage.

I hold this schematization out not as an accurate statement of the exact ratios but as an approximation of what seemingly is the order of distribution. I have not been able to get figures from malpractice insurance carriers to establish the ratios. Yet from indirect methods of estimation it appears that the foregoing schematization, based on an accurately known "apex" of appeal cases, represents the approximate truth and will at least serve to give a tentative conception, pending such time as I am able to work out still more accurate multiples. Unfortunately, trial court records are not classified according to the type of case, and accurate information about the broader substratums represented by (2), (3), (4), (5) and (6) cannot be procured by the usual processes of fact gathering.

These multiples may be applied to a concrete example. In Massachusetts from 1930 to 1940, the known number of cases reaching the appellate courts was 18; according to the "pyramid" the number of claims settled after judgment but before appeal (3×18) would be approximately 54; the number of claims compromised or abandoned after a suit was filed but before trial (9×18) would be approximately 162, and the number of claims compromised before the filing of any suit (20×18) would be approximately 360. If it is assumed that in one third of the appeal cases the defendant wins or obtains a reversal of the plaintiff's judgment, with a remand of the cause to the lower court for retrial, and that in two thirds of the appeal cases the plaintiff prevails, the latter cases would total 12. Substantial sums of money are rarely paid in settlement before a suit is filed.

These estimated numbers of claims on which money awards were made or money was paid have been tabulated (table 3); the average number of physicians in

2. I refer, of course, to materialized risk based on past experience, but this is the orthodox basis for prognosticating future risk.

Massachusetts between 1930 and 1940 was taken as 7,263. One can contrast with these the much larger group of cases in which the physician was negligent in fact or in the opinion of the patient, but the incident did not eventuate in a money settlement. The latter cases have been represented in table 4.

This analysis, tentative though it is, indicates that the risk which the average individual physician carries of 502 of these cases were appealed during the decade from 1930 to 1940 leads to the inference that in the future one may expect compensation to be demanded more often from physicians, with a transfer of many heretofore "potential" claims into the active sphere. One is also led to the conclusion that the crucial consideration for the physician is medicolegal prophylaxis. Since the instances of actually or supposedly negligent

TABLE 1.—*Growth of the American Common Law in Respect to Civil*

Jurisdiction	Date of First Case	Name and Citation of First Appellate Decision	Number of Cases in 1790-1800	1800-1810	1810-1820	1820-1830	1830-1840	1840-1850	1850-1860	1860-1870
Alabama	1821	McDonald v. Harris (Ala. Supreme Court, 1826) 21 So. 548, 121 Ala. 339 (Malpractice here was offense in defense in suit for fee)	..	..	..	..	..	..	..	..
Arizona	1866	Butler v. Bale (Ariz. Supreme Court, 1876) 262 P. 438, 29 Ariz. 495	..	..	..	..	..	..	..	..
Arkansas	1839	Keller v. Lewis (Ark. Supreme Court, 1888) 47 S. W. 755, 65 Ark. 376	..	..	..	..	..	..	..	..
California	1850	Moore v. Teed (Cal. Supreme Court, 1853) 3 Cal. 196	..	..	..	..	..	..	1	..
Colorado	1861	Burnham v. Jackson (Colo. Court of Appeals, 1891) 1 Colo. Court of Appeals Reports, 327	..	..	..	..	..	..	..	..
Connecticut	1704	Cross v. Guthery (Supreme Court of Errors, Conn., 1794) 2 Root 90, 1 Am. Dec. 61	1	..	1	..	1	..	..	..
Delaware	1826	Mitchell v. Atkins (Del. Superior Court, 1850) 1 Harr. A. 382, 6 W. W. Harr. 451	..	..	..	..	..	..	..	..
Dist. Columbia	1810	Bowsey v. Erving (D. C. Appeal Court, 1859) (U. S. Sup. 1913) 25 App. D. C. 57, 43 L. R. A. (N. S.) 734 judgment affirmed 33 S. Ct., 410, 230 U. S. 223, 57 L. Ed. 515	..	..	..	..	..	..	..	..
Federal	1827	Ewing v. Goode (Circuit Court, S. D. Ohio, 1827) 78 Fed. 442	..	..	..	..	..	..	..	..
Florida	1824	Smith v. Sheeler (Fla. Supreme Court, 1854) 127 So. 325, 116 Fla. 668	..	..	..	..	..	..	..	..
Georgia	1800	Smith v. Overby (Ga. Supreme Court, 1809) 20 Ga. 541	..	..	..	..	..	..	1	..
Idaho	1912	Osborn v. Carey (Idaho Supreme Court, 1913) 136 P. 907, 23 Idaho 139	..	..	..	..	..	..	..	..
Illinois	1809	Bitchey v. West (Ill. Supreme Court, 1809) 22 Ill. (12 Peck) 253	..	..	..	..	..	..	..	2
Indiana	1816	Conner v. Winton (Ind. Supreme Court, 1850) 5 Ind. 315, 61 Am. Dec. 761	..	..	..	..	..	..	1	2
Iowa	1840	Bowman v. Woods (Iowa Supreme Court, 1849) 1 G. Greene 441	..	..	..	..	..	1	..	1
Kansas	1870	Tefft v. Wilcox (Kan. Supreme Court, 1870) 6 Kan. 46	..	..	..	..	..	..	..	..
Kentucky	1851	Piper v. Menifee (Ky. Court of Appeals, 1851) 51 Ky. (12 B. Mon.) 465, 54 Am. Dec. 547	..	..	..	..	..	..	1	..
Louisiana	1991	Stern v. Leang (La. Supreme Court, 1891) 31 So. 283, 105 La. 720	..	..	..	..	..	..	..	..
Maine	1848	Howard v. Grover (Supreme Judicial Court of Me., 1848) 28 Me. (15 Shep.) 97, 48 Am. Dec. 479	..	..	..	..	..	1	1	1
Maryland	1839	Stab v. Mosenberger (Court of Appeals of Md., 1889) 70 Md. 102, 16 Atl. 382, 2 L. R. A. 807, 14 Am. St. Rep. 340	..	..	..	..	..	..	..	..
Massachusetts	1853	Twombly v. Leach (Supreme Judicial Court of Mass., 1853) 45 Mass. (11 Cush.) 397	..	..	..	..	..	..	2	..
Michigan	1827	Hyatt v. Adams (Mich. Supreme Court, 1857) 16 Mich. 180	..	..	..	..	..	..	..	2
Minnesota	1854	Chamberlain v. Porter (Minn. Supreme Court, 1854) 3 Minn. 260 (Gil. 164)	..	..	..	..	..	..	..	1
Mississippi	1915	Hood v. McGehee (Miss. Supreme Court, 1915) 69 So. 604, 109 Miss. 757, L. R. A. 1916 B, 602, Ann. Cas. 1917 E, 439	..	..	..	..	..	..	..	..
Missouri	1851	West v. Martin (Mo. Supreme Court, 1851) 31 Mo. 375, 80 Am. Dec. 197	..	..	..	..	..	..	..	1
Montana	1872	Cassidy v. Bates (Mont. Supreme Court, 1879) 1 Mont. 494	..	..	..	..	..	..	..	..
Nebraska	1868	O'Hara v. Wells (Neb. Supreme Court, 1869) 16 Neb. 625, 18 N. W. 722	..	..	..	..	..	..	..	..
Nevada	....	..	..	..	..	..	..	..	..	..
New Hampshire	1816	Leighton v. Sargent (Superior Court of Judicature of N. H., 1833) 89 Am. Dec. 265, 27 N. H. (7 Fost.) 460	..	..	..	..	..	..	1	1
New Jersey	1795	Myers v. Hoborn (N. J. Court of Errors and Appeals, 1856) 20 N. J. Law (25 Vroom) 156, (and Appeals, 1856) 25 Atl. 289, 59 L. R. A. 545, 95 Am. St. Rep. 402	..	..	..	..	..	..	..	..
New Mexico	1916	Hobbs v. Kier (U. S. C. C. A. N. Mex., 1916) 238 F. 681, 151 C. C. A. 15	..	..	..	..	..	..	..	..
New York	1820	Bellinger v. Craigue (N. Y. Supreme Court, 1850) 31 Barb. 534	..	..	..	..	..	..	..	2
North Carolina	1810	Woodard v. Hancock (1909) 59 N. C. 383	..	..	..	..	..	..	..	1
North Dakota	1911	Ellis v. Johnson (N. D. Supreme Court, 1911) 130 N. W. 649, 20 N. D. 75, Ann. Cases, 1913F, 1095	..	..	..	..	..	..	..	..
Ohio	1833	Gallaher v. Thompson (Ohio, 1833) Wright 468	..	..	..	..	2	..	..	2
Oklahoma	1908	Champion v. Keith (Okla. Supreme Court, 1908) 97 P. 865, 17 Okla. 324	..	..	..	..	..	..	..	..
Oregon	1849	Heath v. Glisson (Or. Supreme Court, 1859) 3 Or. 64	..	..	..	..	..	..	..	1
		Williams v. Poppleton (Or. Supreme Court, 1859) 3 Or. 139								
		Boydston v. Giltner (Or. Supreme Court, 1859) 3 Or. 118								
Pennsylvania	1824	Bowen v. Howard (Penn. 1854) 1 Watts 258	..	..	..	..	1	1	2	2
Rhode Island	1824	Bigney v. Fisher (Rhode Is. Supreme Court, 1856) 10 A. 72, 30 R. I. 482	..	..	..	..	..	..	..	..
South Carolina	1855	Hyrne v. Erwin (S. C. Supreme Court, 1855) 23 S. C. 228, 55 Am. Rep. 15	..	..	..	..	..	..	..	..
South Dakota	1903	Baxter v. Campbell (S. D. Supreme Court, 1903) 97 N. W. 368, 17 S. D. 479	..	..	..	..	..	..	..	..
Tennessee	1824	Wood v. Clapp (Tenn. Supreme Court, 1856) 36 Tenn. (4 Sneed) 65	..	..	..	..	..	..	1	..
Texas	1840	Graham v. Gautier (Tex. Supreme Court, 1858) 21 Tex. 111	..	..	..	..	..	..	1	..
Utah	1911	James v. Robertson (Utah Supreme Court, 1911) 117 P. 1068, 39 Utah 434	..	..	..	..	..	..	..	..
Vermont	1827	Wilmot v. Howard (Vt. Supreme Court, 1857) 29 Vt. 447, 94 Am. Dec. 295	..	..	..	..	..	..	..	..
Virginia	1913	Hunter v. Burroughs (Va. Supreme Court of Appeals, 1913) 86 S. E. 305, 120 Va. 133	..	..	..	..	..	..	..	1
Washington	1891	Miller v. Dumon (Wash. Supreme Court, 1891) 64 P. 824, 24 Wash. 648	..	..	..	..	..	..	..	..
West Virginia	1899	Kuhn v. Brownlee (W. Va. Supreme Court of Appeals, 1899) 34 W. Va. 332, 12 S. E. 538, 11 L. R. A. 769	..	..	..	..	..	..	..	..
Wisconsin	1854	Reynolds v. Graves (Wis. Supreme Court, 1854) 3 Wis. 416	..	..	..	..	..	..	1	1
Wyoming	1905	Wright v. Conway (Wyo. Supreme Court, 1909) 241 P. 309, 35 Wyo. 1, Rehearing denied 243 P. 1107, 34 Wyo.	..	..	..	..	..	..	..	..
Totals			1	..	1	..	5	3	13	25
Subtotals from beginning to end of each ten year period			1	..	2	..	7	10	23	48

* Included are only the opinions of appellate courts. Such opinions are published and preserved and form an addition to the common law, serving as precedents in future litigation. Not included are the far more numerous judgments of trial courts. These govern a particular case in the trial court but as a rule are not accompanied by published opinions, form no part of the preserved common law and exert but little influence as precedents.

having to pay large awards or large sums in compromise of malpractice claims is low and that the risk is a little larger in respect to intermediate and petty claims but that the great majority of actionable malpractice transactions constitute a potential reservoir, with no present payment of money involved. The fact that 1,513 cases have reached the appeal courts of the United States during the period from 1794 to 1940 but that conduct are for the most part potential claims only, the interest of the physician lies in the direction of keeping them potential. This he can do in large measure by keeping adequate records, by holding himself in all respects to the level of practice in his community and by keeping in mind the medicolegal bearings of transactions which he must learn to recognize as involving hazard.

In other words, I wish to reiterate the assertion made in part I of this study that it behooves the physician to know the pattern of his legal position as well as possible.

Courts of all states, in evolving the law represented by the 1,513 appeal cases, have depended almost entirely on principles of common law, with free and constant reference to the decisions of sister states. The principles of law applicable to physicians have been substantially alike in the several states, so that only in an occasional situation does the physician have a liability in one state which he would not have in another. It seems that this variation does not affect the incidence of malpractice appeals. I do not overlook the fact, however, that of practice; (c) the difficulty in maintaining the degree of physician-patient intimacy which exists in rural communities or small towns; (d) the increased number of industrial hazards, of cases of fractures and of other transactions which carry greater risk of malpractice; (e) the availability of a larger body of physicians to a rapidly rising incidence may indicate the operation of a variety of factors, as for instance:

1. Increasing expectations directed toward physicians as medical standards advance and the public becomes informed of what is medically possible.

2. Trends toward urbanization, with its several consequences, such as: (a) the increase in "transient" patients of unknown temperament; (b) higher standards

*Liability of Physicians and Surgeons for Medical Malpractice**

Ten Year Periods								Rank in Population	Rank in No. of Cases	Settled	Entered Union		Area, Square Miles	Population, April 1, 1930	Percentage of Total Population	Percentage Urban		Estimated Population, July 1, 1937
1910-1920	1920-1930	1930-1940	1940-1950	1950-1960	1960-1970	1970-1980	Total									1930	1930	
..	..	..	1	0	17	10	28	16	17	1789	Dec.	14, 1959	51,998	2,958,930	2.3	31.7	29.1	3,556,000
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	2	2	2	4	10	15	17	1889	Feb.	14, 1912	113,909	325,573	0.4	53.2	54.6	432,000
..	..	1	2	4	7	4	18	12	17	1889	Nov.	11, 1889	70,183	1,563,396	1.2	51.4	52.0	1,648,000
..	1	1	2	4	7	4	19	9	1	1789	Sept.	5, 1789	158,297	5,677,251	4.6	69.0	71.3	6,154,000
..	..	1	1	7	7	6	22	25	27	1959	Aug.	1, 1970	103,948	1,935,791	0.5	45.2	50.3	1,971,000
..	..	2	..	1	6	12	21	23	25	1953	Jan.	9, 1788	4,989	1,058,910	1.2	67.8	70.4	1,241,000
..	..	..	..	..	1	1	2	27	29	1788	Dec.	7, 1787	2,370	382,129	0.3	54.3	61.7	398,000
..	..	..	..	1	5	7	13	19	22	.....	.....		.....	680,207	0.4	100.0	100.0	677,000
..	..	..	2	6	2	5	15	..	..	.....	.....		.....	.....	..	....	....	.....
..	..	..	..	..	..	5	5	10	15	1850	March	3, 1845	58,000	1,631,511	1.2	30.7	31.7	1,670,000
..	..	..	4	6	15	16	42	13	13	1793	Jan.	9, 1788	29,385	2,939,306	2.4	39.1	39.3	3,068,000
..	..	..	..	2	2	4	11	41	37	1845	July	3, 1850	262,398	447,039	0.4	37.3	39.1	466,000
..	..	..	2	2	2	4	11	31	31	1912	Jan.	6, 1912	84,290	1,630,654	1.3	67.9	71.3	1,670,000
0	1	1	10	27	11	10	79	3	4	1788	Dec.	7, 1787	9,891	6,646,697	5.4	84.9	84.7	7,070,000
1	2	7	4	5	4	7	30	12	11	1792	Dec.	11, 1816	53,924	3,538,080	2.8	39.6	45.5	3,474,000
0	2	0	1	2	2	5	12	30	6	1788	Dec.	18, 1788	10,147	2,470,939	2.0	58.4	59.8	2,552,000
2	..	2	2	2	2	2	10	20	20	1787	Jan.	2, 1788	8,056	1,989,499	1.5	34.9	36.8	1,994,000
..	2	1	7	9	12	13	45	15	12	1795	June	1, 1796	48,000	2,614,589	2.1	38.2	39.6	2,589,000
2	..	..	..	1	1	0	4	19	22	1820	April	0, 1812	45,000	5,128,289	1.7	34.9	39.7	5,332,000
2	2	3	1	1	1	1	11	28	28	1864	March	13, 1889	32,000	797,423	0.6	29.0	40.3	853,000
..	1	2	1	1	2	3	11	39	40	1864	April	30, 1795	10,887	1,631,526	1.3	69.0	69.8	1,679,000
2	2	2	2	4	10	10	30	9	10	1889	Feb.	6, 1788	8,326	4,249,614	3.5	84.8	89.2	4,425,000
2	1	2	2	5	6	10	28	29	7	1819	Jan.	26, 1837	57,980	1,942,908	1.9	61.1	62.3	4,000,000
2	1	2	4	14	10	17	61	19	7	1905	May	11, 1859	84,682	2,563,953	2.1	44.1	49.9	2,564,000
..	..	..	..	2	2	3	7	34	41	1716	Dec.	10, 1817	46,865	2,939,921	1.6	13.4	16.9	2,964,000
1	2	2	2	21	22	20	91	2	2	1791	Aug.	10, 1921	49,430	3,629,367	3.0	69.6	71.3	3,979,000
2	..	1	..	1	2	2	15	49	32	1859	Nov.	9, 1889	145,587	537,606	0.4	31.3	33.7	530,000
..	2	2	2	4	6	7	27	32	32	1847	Feb.	9, 1867	77,510	1,377,963	1.1	33.3	35.3	1,364,000
..	..	..	..	..	..	..	0	20	20	1859	Oct.	31, 1864	110,690	21,269	0.1	19.7	27.8	101,000
2	..	2	2	2	1	2	13	48	37	1889	June	21, 1788	9,941	665,566	0.4	61.1	58.7	699,000
..	..	1	1	2	2	11	25	2	24	1924	Dec.	10, 1787	5,224	4,041,334	3.3	78.4	82.6	4,320,000
..	..	..	..	..	1	..	1	44	45	1837	Jan.	6, 1912	122,634	435,917	0.3	18.0	25.3	432,000
1	2	11	2	10	11	20	58	1	1	1914	July	28, 1788	49,204	12,588,066	10.3	68.7	68.6	13,048,000
..	..	2	1	4	3	10	20	12	10	1889	Nov.	21, 1789	52,426	5,170,276	3.6	10.2	55.2	5,474,000
..	..	..	..	0	0	0	0	35	39	1789	Nov.	2, 1889	70,057	680,845	0.6	13.6	14.0	703,000
2	1	1	1	5	12	11	33	4	15	1792	March	1, 1803	41,040	6,646,697	5.4	69.8	67.5	6,774,000
..	..	..	2	4	9	10	25	21	18	1889	Nov.	16, 1907	70,837	2,333,860	2.0	30.6	34.3	2,389,000
..	..	1	1	3	10	12	29	34	19	1889	Feb.	14, 1889	84,289	692,789	0.5	49.9	51.3	1,000,000
2	1	1	2	5	6	6	23	42	2	1889	Dec.	12, 1787	45,126	5,621,329	7.5	64.3	67.3	10,110,000
..	..	..	0	2	1	1	4	38	41	1889	May	29, 1789	1,248	687,497	0.6	87.5	92.4	681,000
..	1	1	..	1	2	1	6	37	42	1889	May	29, 1784	39,959	1,739,765	1.4	17.5	21.3	1,825,000
..	..	..	1	..	1	0	2	47	47	1791	Nov.	2, 1889	77,615	692,849	0.6	34.0	33.9	686,000
..	..	..	1	1	7	10	21	17	26	1787	June	1, 1796	49,959	2,614,589	2.1	38.1	34.3	2,589,000
1	..	1	..	5	13	15	39	5	15	1889	Dec.	10, 1845	262,506	5,824,715	4.7	39.4	41.9	6,172,000
..	..	..	..	2	4	6	14	31	35	1907	Jan.	4, 1959	84,289	2,377,547	2.4	69.4	69.4	2,377,000
..	..	..	..	2	4	6	14	41	43	1907	June	15, 1788	41,687	2,631,351	2.0	39.2	39.4	2,704,000
1	..	..	1	3	3	7	15	33	30	1776	March	4, 1791	9,566	359,611	0.3	21.2	33.0	389,000
..	..	..	1	10	10	21	72	21	5	1911	Nov.	11, 1889	69,127	1,535,234	1.3	35.3	34.6	1,624,000
..	..	..	2	2	1	4	9	15	22	1787	June	20, 1863	24,170	1,729,205	1.4	35.2	39.4	1,764,000
1	2	2	2	11	21	11	54	14	9	1870	May	29, 1848	84,990	2,629,636	2.4	47.3	52.9	2,564,000
..	..	..	..	..	2	2	4	48	45	1864	July	10, 1889	97,914	325,510	0.3	29.5	31.1	332,000
45	47	77	116	252	299	302	1,513							122,775,046	100.0	....	....	129,114,000
93	140	217	333	685	1,081	1,513												

† Rate of increase in the population of continental United States: 1790 to 1800, 35.1 per cent; 1800 to 1810, 36.4 per cent; 1810 to 1820, 33.0 per cent; 1820 to 1830, 33.5 per cent; 1830 to 1840, 32.7 per cent; 1840 to 1850, 35.9 per cent; 1850 to 1860, 35.6 per cent; 1860 to 1870, 26.6 per cent; 1870 to 1880, 29.0 per cent; 1880 to 1890, 25.5 per cent; 1890 to 1900, 20.7 per cent; 1900 to 1910, 21.0 per cent; 1910 to 1920, 14.9 per cent, and 1920 to 1930, 16.1 per cent. The number of physicians in continental United States in 1936, according to figures gathered by the American Medical Association, was 165,161, of which number 24,813 were in New York; 12,039, in Pennsylvania; 11,672, in Illinois, and 10,535, in California. The number of medical graduates in 1937 was 5,767, as against 5,691 in 1936 and 5,561 in 1935. The annual number has not fallen below 7,000 since 1924, when the total was 6,671.

‡ Rural population means under 2,500.

draw from to serve as expert witnesses in making the necessary proof, and (f) the availability of a larger bar, with a greater chance of finding an attorney willing to handle the claim.

3. Advent of new diagnostic instrumentalities, such as the roentgen rays, which cause previously unsuspected or latent negligence to become patent.[3]

TABLE 2.—*Incidence of Appeal Cases of Civil Malpractice in Jurisdictions of the United States According to Population and Number of Physicians*

State or Jurisdiction	Total Cases 1794 to 1940		Total Cases 1930 to 1940		Cases per Million Population 1930 to 1940		Cases per Physician 1930 to 1940	
	No.	Rating	No.	Rating	No.	Rating	No.	Rating
Alabama	36	17	10	30	3.454	30	0.0046	16
Arizona	4	47	2	31	4.854	21	0.0038	22
Arkansas	19	27	3	37	1.464	42	0.0015	38
California	103	1	60	1	9.749	7	0.0055	12
Colorado	19	27	8	23	7.469	9	0.0041	19
Connecticut	23	25	12	15	6.892	11	0.0049	15
Delaware	1	48	1	46	2.691	28	0.0031	30
Dist. Columbia	15	32	7	27	11.164	6	0.0035	24
Federal courts	15	...	5	...	.....	...	.....	...
Florida	5	45	5	32	2.994	33	0.0025	32
Georgia	47	13	18	6	5.834	14	0.0065	9
Idaho	13	37	6	30	12.178	3	0.014	2
Illinois	78	4	15	12	1.904	39	0.0012	41
Indiana	46	11	7	27	2.914	38	0.0017	37
Iowa	65	6	8	23	3.134	32	0.0025	32
Kansas	29	20	5	32	2.697	35	0.0022	35
Kentucky	45	12	13	13	4.442	23	0.0046	16
Louisiana	19	27	9	22	4.221	24	0.0042	18
Maine	26	22	5	32	5.817	15	0.0052	13
Maryland	11	40	3	37	1.786	40	0.0010	43
Massachusetts	50	10	18	6	4.067	25	0.0024	34
Michigan	39	8	22	3	4.575	22	0.0037	23
Minnesota	61	7	17	10	6.428	12	0.0051	14
Mississippi	7	41	2	41	0.992	46	0.0013	39
Missouri	91	3	20	5	5.661	20	0.0032	28
Montana	15	32	3	37	5.565	16	0.0062	11
Nebraska	27	22	7	27	5.128	19	0.0039	20
Nevada	0	49	0	49	0.000	48	0.0000	48
New Hampshire	13	37	2	41	3.929	26	0.0033	26
New Jersey	25	24	11	17	2.556	36	0.0021	36
New Mexico	1	48	0	49	0.000	48	0.0000	48
New York	96	2	32	2	2.471	37	0.0013	39
North Carolina	29	20	18	6	5.172	18	0.0070	8
North Dakota	18	30	8	23	11.347	5	0.015	1
Ohio	38	16	11	17	1.619	41	0.0012	41
Oklahoma	31	18	16	11	6.391	13	0.0062	9
Oregon	30	19	12	15	11.741	4	0.0060	5
Pennsylvania	42	15	15	13	1.278	44	0.0010	43
Rhode Island	8	41	1	46	1.453	43	0.0010	43
South Carolina	6	43	1	46	0.537	47	0.0007	47
South Dakota	12	37	5	32	7.225	10	0.0066	6
Tennessee	31	26	10	20	3.473	29	0.0034	25
Texas	39	15	18	6	2.916	34	0.0026	31
Utah	14	35	8	23	15.414	1	0.014	2
Vermont	6	43	3	37	5.221	17	0.0029	30
Virginia	14	35	2	41	1.198	45	0.0010	43
Washington	72	5	21	4	12.695	2	0.010	4
West Virginia	15	32	6	30	3.217	31	0.0033	26
Wisconsin	54	9	11	17	3.759	27	0.0022	28
Wyoming	5	45	2	41	8.510	8	0.0076	7

4. The sheer number of cases in a community or a state, with their varying degrees of publicity, which may create a public awareness of medical responsibility in law.

5. Encouragement to suit afforded by the presence of malpractice insurance. Though it is a reversible error, as a consideration calculated to bias the jury, for the plaintiff to disclose in the course of a trial that the defendant has malpractice insurance, the plaintiff's lawyers usually have means of discovering the presence of such insurance. Obviously, a plaintiff is more apt to sue when he is sure that any judgment obtained will be collectible, and he is less apt to compromise for as small a sum as he might accept from an unprotected defendant of limited financial resources.

6. Industrialization of certain areas.

7. Presence of hazardous occupations in a given area, as for instance the numerous cases of fractures apt to be encountered in certain western states in connection with "logging" camps or in states with high automobile collision rates.

TABLE 3.—*Malpractice Claims on Which Money Was Awarded or Paid in Massachusetts Between 1930 and 1940*

	Number	Average Amount Involved	Rate per 1,000 Physicians * For 10 Yr.	For 1 Yr.
Appeal cases	12	$1,000 or more	1.65	0.165
Trial court judgments settled before appeal †	54	$500 or more	7.43	0.743
Claims compromised after suit was filed but before trial †	102	$100 to $1,000	22.30	2.230
Petty claims compromised before suit was filed, either by paying money or by canceling bill †	360	$3 to $200 (occasionally higher)	49.50	4.950
Total	588		80.88	8.088

* The average number of physicians in Massachusetts between 1930 and 1940 was 7,263.
† Estimated number.

8. Flux or rapid change in the population, particularly with reference to newcomers, strangers and transients in the community. Such factors seem to play some part in the increasing tide of malpractice cases in California.

9. Possible shift of policy on part of defendants from early settlement to "last ditch" fight in appellate courts. Clearly, if defendants resolve to carry most cases involving $1,000 or more to an appeal court as a matter of course, such a policy of protracted litigation may cause the number of appeal cases to rise out of all proportion to the increase in the number of underlying malpractice situations. To determine the effect of this factor one would need a statement from malpractice

TABLE 4.—*Instances of Negligence by a Physician, in Fact or in the Opinion of the Patient, in Massachusetts Between 1930 and 1940 Which Did Not Eventuate in a Money Settlement*

	Number *	Amount Involved	Rate per 1,000 Physicians † For 10 Yr.	For 1 Yr.
Cases won by physicians in trial courts; claim against physician considered but abandoned without active assertion (100 × 18)	1,800	Varies widely; usually small	248	24.8
Instances in which the physician was negligent in fact or in the opinion of the patient, but no consequence ensued except, perhaps, a loss of good will or a change of patronage (1,000 × 18)	18,000	Varies widely; usually small	2,480	248.0
Total	19,800			

* Estimated.
† The average number of physicians in Massachusetts between 1930 and 1940 was 7,263.

insurance carriers (so far not forthcoming) as to how many of the cases appealed since 1900 were taken up by companies and a statement of the number of large (not petty) claims compromised by payment of substantial sums as compared with the number of such claims carried to the appeal courts before payment. Such data might explain in part the inordinate per-

3. Roentgenograms were pressed into service as medical evidence soon after Roentgen's discovery of x-rays. The first American case in which they were offered seems to have been *Smith* v. *Grant*, 29 Chicago Legal News, 145, Dec. 3, 1896.

centage increase in appeal cases over the percentage increase in physicians and in population from 1900 to 1940.

It is not my intention to place a mathematical valuation on these factors, which seemingly account for the rise in the number of malpractice cases reaching American appeal courts. In each community they may have a different relative importance. Also, each local practitioner will know what peculiar or additional factors have a bearing on the malpractice problem in his own community.

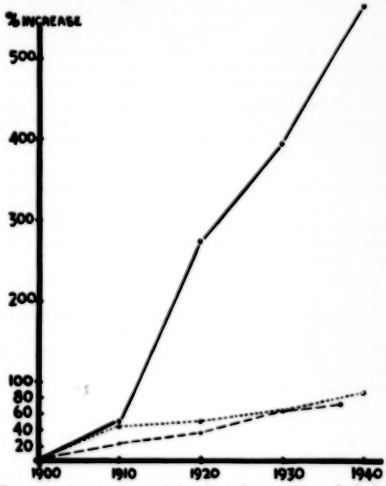
The tables are offered as a statement, accurate within a small range of error, of the incidence of malpractice appeal cases. The reader is invited to interpret these data as he sees fit and even to apply different multiples to ascertain the lower tiers of the malpractice "pyramid" if he has more accurate information as to ratios in his particular locality. My inferences seem to fit in with the data available and are put forward to replace the fog of conjecture as to the size of the malpractice problem with at least a crude approximation of objective fact. Should insurance carriers be able to show by authenticated records the need for revision of some of these inferences, it might become necessary to reconsider certain statistical aspects of the problem in a later publication.

It would be interesting to the medical profession to know whether malpractice insurance merely relieves against the annoyance of petty claims and what the odds are that the physician in taking a policy buys a ticket for a long journey through the appellate courts because of the larger malpractice claims which may be urged against him. Some malpractice cases have been to the appeal courts two and three times and have been kept in litigation for as long as fifteen years. Naturally, under the ordinary insurance policy, the sole discretion as to whether a claim shall be compromised or defended rests with the insurer, and the physician may at times have to cooperate in a defense contraindicated by his better judgment or have his protection forfeited. This is a serious problem in regard to all malpractice insurance written by private companies, for the economic interest of the carrier may well be advanced by vigorous defense and protracted litigation. The physician may have an opposing interest in early compromise as a means of conserving his time and protecting his reputation against too long a sojourn in the courts. Whether these two interests can be reconciled with fairness to both the physician and the insurer will determine the success of their mutual relations and will enable the physician to decide for himself the value of a proposed insurance coverage.

It seems significant that between 1615, when the decision was reached in the case of *Everard* v. *Hopkins*, first of the modern malpractice cases in English law, and 1940 a total of less than 100 cases have come before the appeal courts of the British empire. This bears comment since the doctrines of medical responsibility under English law are quite similar to those applied in the United States, and a plaintiff has like rights of access to the courts and like powers of appeal. I make this comparison with reservation, since the volume of American appeal cases on all subjects exceeds that of the British. Yet the fact that in certain years between 1930 and 1940 no malpractice cases reached the British appeal courts, with only a handful for the ten years as contrasted with 502 in the United States, seems to bespeak a profound difference in the way the malpractice problem is being handled in the British empire and the way it is handled in the United States.

In summing up, one gains the impression that the malpractice hazard varies considerably in different sections of the United States. The physician should consult the tables to get an idea of the incidence of appeal cases (the controversies involving large sums worth fighting over) both per physician and per million of population in his state. He will then ask himself the following questions:

1. Am I engaged in hazardous practice, such as work with fractures, the practice of surgery or obstetrics, the diagnostic or therapeutic use of roentgen rays or other types of work calling for dramatic changes of the patient's status quo or affirmative action as compared with more cautious watchful waiting? If so, my average risk may be larger than the crude rate; if not, it may be even smaller.



Percentage increase in population (dash line), number of physicians (dotted line) and number of civil malpractice appeal cases (solid line) in United States from 1900 to 1940. Values for 1900 were used as the basis for all calculations.

2. Am I located in a community carrying special risks of injury or showing heavy industrialization? Is my practice to a large extent made up of patients who are transient, "unknown" or strangers, or is it a select practice among conservative people of known stability who would be slow to assert a claim of negligence?

3. Am I practicing in a large urban center with more impersonal relations to patients than a rural or small town practitioner enjoys?

4. Am I equipped with the knowledge, judgment, care and skill possessed by fellow practitioners of my community who belong to the same group (such as general practitioner or specialist) and to the same "school of medicine"? Am I able to apply these qualities consistently in the contacts I have with patients?

5. Am I subject in my practice to the risk of fraudulent claims by persons of unknown temper or moral character?

6. Am I conversant with the more important principles governing my legal position, so that I can avoid future trouble by taking pertinent precautions in advance?

In addition to the large group of transactions already mentioned in which the patient is the moving actor, another large group exists in which alleged malpractice is put forward as the ground for refusal to pay a medical bill. Most courts hold that a medical contract is "entire" and not "separable." Therefore, the negligence of a physician in any phase of a continuous treatment defeats his whole bill and not merely the charge for the negligent visit. When the physician files suit for services rendered, the patient may plead malpractice in defense. He may go still further and in the same case file a counter claim for affirmative damages. In such event, he becomes plaintiff in respect to the counter claim, and the physician becomes defendant. In effect, these are two separate cases being tried together: the main action for the medical fee and the counter claim, or so-called "cross action," for malpractice. This procedure is justified on the ground that since both controversies arise out of the same transaction all disputed questions can be settled conveniently in a single proceeding without multiplicity of suit. Sometimes, an unscrupulous patient threatens to plead "malpractice" if sued for his bill, trafficking on the natural desire of the physician to avoid aspersions against his professional conduct.

Every malpractice contention will present itself either as (1) an affirmative claim by a patient, which may be (a) a bona fide assertion or (b) fraudulent or so wholly lacking in foundation as to compel the inference that the patient is acting in bad faith, or (2) a "defensive" claim set up in opposition to the physician's bill for services rendered, to which either (a) or (b) may apply.

The physician should distinguish carefully between the bona fide and the unconscionable type of case, for the two types fall into different categories, both legally and morally. Moreover, from the standpoint of practical trial strategy, one must never forget that the favorite sport of average jurors is to unmask fraud; their one predictable allegiance is to their instinctive or formulated conception of what would be a "square deal" on the merits. Psychologically, this sometimes turns on a subconscious vindication of their own inherent decency. Juries of high or of low moral caliber tend to follow this consideration with amazing uniformity, as a sort of compass in the fog of disputed fact. Let the fact come home to a jury, through the evidence or through inescapable psychologic impressions, that the moving party behind a contention seeks unjust enrichment by a false claim or by a fraudulent trick or device, and the reaction of the jurors is promptly to block the way by adverse fact findings in their verdict. Hence, in cases tinged with fraud, the attorney for the physician has a brilliant opportunity for a crushing cross examination and exposure of the adverse litigant's true position.

When a physician has done his best, in conduct prosecuted with good faith, he may be tempted to look on the assertion of negligence by a patient as a fraudulent imposition. But the law does not force the patient to assume all the risks any more than it requires the physician to be a guarantor of treatment. If there is a substantial ground on which a patient can reasonably believe he has suffered from the negligence of another, even though he is mistaken, the law has an interest in protecting his free access to the courts so that the bona fide issue may be tried. The very purpose of the courts is to settle such disputes as fairly as possible. The purse-sparing propaganda that a physician must fight every malpractice claim to save the "honor" of the medical profession has often clouded clear thinking. It has led to the defense of more than one claim which should have been compromised. The ordinary case of civil malpractice does not involve moral turpitude but is an action seeking compensatory damages for simple negligence; every case is not an "indictment" of the medical profession which calls for the cooperation of all good practitioners in saving the common honor whatever the merits of the claim.

When, on the other hand, a claim is asserted fraudulently, though the law cannot cut off the plaintiff's right of access to its tribunals without prejudging the very question to be tried, a new question is presented. The patient in such case is trying to use the courts as a vehicle for his fraud and unjust enrichment. Physicians and lawyers who knowingly espouse such causes should be reprimanded and regulated by their professions. Thought should also be given to the question of whether the medical profession should not support proper legislation to confer on trial court judges, in event of the finding that the claim was asserted fraudulently or without any bona fide foundation, the discretionary power to tax against the offending party not only court costs but an allowance to the injured party for reasonable attorney's fees and compensation for expense and loss of time. At present, even if the physician prevails in such a case, the judgment in his favor causes only the bare court costs to be taxed against the plaintiff. There are no uniform state statutes allowing him to recover a further amount to cover his reasonable attorney's fee and expenses of litigation.[4]

The law has always abhorred any rule which might intimidate a citizen in the assertion of a legal right or deter him from having his day in court. This policy is manifested in several ways. Thus, whatever a litigant says in pleading his case or as a witness is privileged and cannot be made the foundation of an action for libel or slander by an opposing litigant who claims his reputation has been injured thereby.[5]

More debatable, therefore, is the question whether injury to the physician's professional reputation by the filing of a groundless suit could properly be made the subject of special damages. The suggested legislation, alone, might well deter the assertion of many "nuisance value" claims.

It is true that a witness who falsifies while under oath in a civil proceeding may later be prosecuted criminally for perjury. Yet, since such prosecution is a criminal law proceeding, the indictment needs to be proved beyond a reasonable doubt; and for a number of reasons, abuse of civil proceedings by a fraudulent plaintiff cannot be adequately dealt with by this method.

The problem of the "nuisance value" case is one of the most pressing of the law's unsolved problems. It is not peculiar to cases affecting physicians. All such cases rest on a common formula: X with a groundless or unsubstantial claim, on the merits of which even he does not expect to prevail, files a suit against Y. Y must answer and defend or suffer a default judgment. The

4. McCormick, C. T.: Handbook on the Law of Damages, St. Paul, West Publishing Company, 1935, p. 234.

5. On proper motion in advance of trial, judges will strike out frivolous, scurrilous or malicious pleadings, visibly intended to discredit the other party and not to serve as a basis for proposed proof. Again, trial courts will prevent the introduction of testimony of like character on timely motion by the offended party.

trial will involve time and expense, and Y's attorney's fee to defend the case will be, for example, $300. Even if Y wins, he cannot recover the attorney's fee. X offers to compromise for $200. Under such an arrangement, Y is not making a compromise settlement of a "bona fide" equity. Lawyers who knowingly espouse such claims are reprehensible. Fortunately, few will do so, but the door is open to considerable hardship in the case of the physician, for he must consider not only the relative costs of the alternative courses of action but the undesirable effect a suit may have on his professional status.

The statute suggested would need to be drawn to conform to constitutional guarantees. The main requirement of similar legislation was held by the United States Supreme Court, in *Missouri, K. & T. Ry. Co. of Texas* v. *Cade* (233 U.S. 642, 34 S. Ct. 678, 58 L. Ed. 1135-1914), to be the avoidance of discrimination against persons affected, under the "equal protection" clause of the federal constitution.[6]

EVOLUTION OF A FORMULA FOR TESTING THE LEGAL SUFFICIENCY OF A MALPRACTICE CLAIM

In the face of this large and growing body of malpractice law, is it possible to get away from the confusing minutiae of individual cases and evolve a formula which will fit them all? Invaluable as reviews of current cases may be, the physician is still in need of a critique by which all malpractice situations may be judged. If this paper can convey to him a reasonable rationale, its purpose will be fulfilled. Its object is thus to orientate the subject rather than to exhaust it.

The method used to arrive at a formula has been to analyze a large number of cases in the light of this inquiry: What are the irreducible essentials of all malpractice actions?

Suppose the defendant, after filing an answer to a malpractice action, sits back and says: "Let the plaintiff prove a case if he can." The minimum legal components which an unopposed plaintiff must prove by a preponderance of the evidence to entitle him to recovery may justly be called the essentials of plaintiff's prima facie case.

In dealing with the law of malpractice, if the nonessential language of the decisions and collateral considerations is pushed aside, one finds that these minimum legal components necessary to support recovery may be stated for all transactions as: (1) duty (due from defendant to plaintiff), plus (2) breach of duty, plus (3) proximate causation, plus (4) injury to plaintiff (damage). These may be recast into a formula easier to keep in mind: (1) duty, plus (2) dereliction, plus (3) direct causation, plus (4) damage.

If the physician will hold fast to the individual identity and the indispensability of each of these four components, the "four D's," he will be able to break down and understand any malpractice problem. This is a fundamental point of departure, and much of what follows will be an elaboration of these telescoped concepts.

DUTY

Example.—Plaintiff, X, proves dereliction, direct causation and damage and rests his case.

The evidence shows that X one day was riding on a subway train. He fell into informal conversation, without introductions, with Y, a pleasant gentleman sitting next to him. X volunteered that he had long been suffering from constant, severe headaches which acetylsalicylic acid did not help. Y remarked that he had known of some cases in which such pain was relieved only by aminopyrine. X, chancing to look down at a case carried by his new acquaintance, saw embossed in gold thereon, "John J. Johnson, M.D., City Hospital." That night he had his cousin, an employee in a drug store, send him some aminopyrine. This drug afforded delightful relief, and he continued to take it daily. Severe granulocytopenia developed, with resulting physician's bills and loss of time from work.

For these damages, X files suit againt Y. He offers medical testimony showing that the aminopyrine was the probable cause of the granulocytopenia and that prudent local practice calls for its administration in regulated amounts and with periodic studies on the blood. The plaintiff also offers evidence that the physician's bills and expenses incurred in his treatment were reasonable and testimony establishing his loss of earnings during the sickness. Thereupon, he rests his case. The defendant offers no evidence but files a motion for an instructed verdict asserting that the plaintiff has not made out a prima facie case of malpractice entitling him to go to the jury.

The court must instruct a verdict for the defendant, Y. Y made his remarks in a casual way and not in his identity as a physician or for the specific reliance of X. He was not putting forward his information in a professional way. The information imparted was general and not of the specific quality of personal medical advice.

Clearly, no implied contract of employment was intended by either party. X had no notion of engaging Y in a professional capacity nor Y of making a charge, nor could it be said that Y by his remarks undertook the gratuitous treatment of X as his patient. From the revealed circumstances, no duty can be made out, and the plaintiff's case must therefore fail.

(But note that such duty, and therefore a prima facie case, would arise if the facts were slightly different. Suppose the following is the case: X looks at the bag of Y and says: "Oh, I see you are Dr. Johnson," and explains his ailment and impecunious condition. Y says: "Look here, my friend, come down to the outpatient department, and I shall treat you gratis." Thereafter Y administers aminopyrine in a negligent manner to X as a gratuitously treated outpatient. Y may be liable for malpractice.)

DERELICTION

Example.—Plaintiff, X, proves duty, direct causation and damage and rests his case.

The evidence shows that X, a concert violinist, sustained a Colles fracture of the left radius and a fracture of the scaphoid bone when he fell while skating on the ice. He called Y, who reduced and set the fractures, but a poor recovery followed, with final deformity and limitation of the movements of the hand, which incapacitated X as a musician.

He files suit against Y. He offers evidence of the damage sustained through loss of earning power. He offers medical testimony that the function of his left

6. Amendment XIV. Constitution of the United States:
"Article XIV, Section 1: All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."

hand and its fingers has been impaired permanently. He testifies in his own behalf as to the stiffening of his wrist and his inability to play his instrument successfully. Other musicians give supporting evidence that he has lost his previous delicate fingering, so essential in rendering difficult compositions. The plaintiff thereupon rests, and defendant files a motion for an instructed verdict.

The court must instruct a verdict for the defendant, Y. X has not made out a prima facie case, for he has failed to prove dereliction or fault. The law does not make Y an insurer or guarantor that his treatment will be successful. He is responsible only for negligence, and when negligence depends on a medical dereliction it cannot be proved by lay testimony; its proof requires the evidence of qualified experts. The bad result of treatment, if extreme, may constitute some evidence of negligence but not enough to satisfy plaintiff's burden of proof on his prima facie case. It will not carry the case to the jury, for the reason that a trial court or appellate court could not permit a jury verdict of negligence to stand when based on evidence of the result of treatment alone.[7]

When evidence is so unsubstantial that reasonable men could not found a verdict on it, the trial court, on timely motion, has a duty to take the case from the jury and instruct a verdict against the party failing on his burden of proof. Conversely, if a plaintiff offers such strong testimony, not contradicted by credible evidence, that no reasonable man could find to the contrary, the trial court (on timely motion) has a duty to instruct a verdict for the plaintiff. If by oversight or through mistaken judgment the trial judge submits a case to the jury when the evidence is insufficient to support a verdict for the plaintiff (or vice versa), he may rectify the error after verdict by granting a new trial. In some states he may enter judgment notwithstanding the verdict ("judgment non obstante veredicto") in favor of the party who was entitled to an instructed verdict in the first instance. Suppose, for example, a plaintiff has made out a prima facie case of malpractice, while the defendant has not offered prima facie evidence making out a defense. The plaintiff files a motion for an instructed verdict, which the court overrules, permitting the case to go to the jury. A verdict is returned for the defendant, and the plaintiff files motion for judgment "notwithstanding the verdict," which the trial court denies, entering judgment instead in favor of the defendant. On appeal by the plaintiff, the higher court is entitled to say: "Whether there was sufficient evidence on the part of defendant to create a disputed issue of fact warranting submission to the jury presents a question of law and is, therefore, a proper subject for our review. Only jury findings of disputed fact are binding on us." The appeal court accordingly will reverse and render the judgment, taking it away from the defendant and awarding it to the plaintiff (or vice versa, as the case may be). In event the jury has not returned findings on the amount of damages, the higher court may simply reverse and remand the case for a new trial. In any event, it is clear law that an appeal court has power to disturb a judgment on the ground that the verdict on which it depends rests on evidence too unsubstantial to warrant a reasonable man's basing fact findings on it.

7. A rare exception exists in cases to which the doctrine of "res ipsa loquitur" applies, but its application is admitted by so few courts and restricted to such exceptional cases that the subject may be passed by for the time being.

DIRECT CAUSATION

Example.—Plaintiff, X, proves duty, dereliction and damage and rests his case.

X's evidence shows that her husband, Z, received a mortal injury to the brain in an automobile collision. He was taken to a police station in a nearby town. Y, the police surgeon, examined the unconscious man, found no evidence of the damage to the brain, entered a diagnosis of intoxication and left him overnight at the station house, negligently failing to put him in a nearby hospital, where roentgenograms and lumbar punctures would have revealed the condition. Y had been told that Z had been unconscious for over an hour as the result of a bad automobile crash. A day later Z was taken to his home, where he was attended for four days by a local physician. On failure to improve, he was transferred to a hospital, where the correct diagnosis was established. He was in a moribund condition and died within seventy-two hours of admission.

X, the surviving spouse, files suit against Y, seeking damages for wrongful death. After introducing the foregoing evidence in support of her allegations of negligence, X rests her case. Y files a motion for an instructed verdict.

The court must grant an instructed verdict for Y. It is not enough that a plaintiff shows dereliction and damage; he must show a causal relation between the two. When the injury in respect to which the physician is negligent is itself a sufficient cause of the damage, as the death here, the plaintiff has the burden of showing that the physician's dereliction was a substantial contributing cause. In this case the plaintiff would need to prove that had Y exercised due care and referred Z to the hospital because of the story of trauma and the continuing unconsciousness, probably Z's life could have been saved. Such likelihood is a prognosis dependent on expert knowledge and so would need to be shown through the testimony of qualified physicians. Having failed in such proof of causation, X has not made out her prima facie case. The jury cannot be allowed to rest a verdict on mere supposition or surmise or to compensate X in respect to an injury (death of her husband) which, from all the evidence shows, was as likely to have resulted irrespective of Y's negligence and despite the best of care. (*Ramberg* v. *Morgan* [Supreme Court of Iowa] 1928, 218 N.W. 492 is an actual case so holding).

DAMAGE

Example.—Plaintiff, X, proves duty, dereliction and direct causation and rests her case.

The evidence shows that X, being pregnant and feeling labor pains, called in physician Y. After a time, seeing that progress was slow, Y said that he would go away for an hour and return. Instead, he negligently absented himself for four hours. After his return an uneventful delivery was effected, with prompt convalescence of the mother. X, joined by her husband, sues Y for mental anguish and apprehension, which, she said, resulted from her terror of an imminent birth during Y's prolonged and unjustifiable absence.

After offering evidence in support of these allegations, plaintiff rests her case, praying for $5,000 damages. Defendant, Y, files a motion for an instructed verdict.

The court must instruct a verdict for the defendant. The American courts do not permit the recovery of damages for so-called shock or mental anguish

unattended by any actual injury.[8] Such damages are regarded as too speculative for fair ascertainment. If the dereliction were to be considered a breach of contract, nominal damages (1 cent or 1 dollar) could be ordered entered by the court for the plaintiff, and in some states this would cause court costs to be taxed against the defendant. But the better view, and the one which it is believed the majority of courts would take, is that the contract of employment merely raises the duty of the physician, while its breach is a tort. The law allows nominal damages for breach of contract, without proof of actual damage. In negligence actions, however, since the cause of action is based on the law of torts, the better view denies nominal damages when actual damages are not proved. Verdict in this case should be instructed for the defendant, Y.

I have taken care to put only cases in which the plaintiff fails to recover because of some fatal defect in the proof of his prima facie case. There is some lack of one of the "four D's," and if any one is missing, the plaintiff has fallen short and cannot recover. On these the plaintiff has the "burden of proof." The burden of pleading follows the burden of proof; so it is evident that in his petition or declaration, wherein he pleads the "essential facts" of his grievance, the plaintiff must necessarily plead the "four D's." Pleadings are required for the purpose of giving the opposing party notice of one's contentions and fair opportunity to prepare his reply and countering evidence. It is therefore a cardinal rule that a plaintiff cannot prove what he does not plead. Thus, even if a plaintiff has evidence available to prove the "four D's" but has omitted to plead one of them, there is a fatal variance between proof and pleadings.

On proper objection, the court will exclude the proffered testimony on the subjects not pleaded. In such case, plaintiff will prevail only in event he can secure leave to file a "trial amendment" conforming his pleadings to the proposed proof. Whether this will be allowed so late as trial lies strictly within the sound discretion of the trial court. Thus, occasions may arise when the defendant will prevail either because: (1) the plaintiff has evidence available to prove the "four D's" but has failed to plead one or more of them in advance of trial and is impaled on the rule that one cannot prove what he has not pleaded; (2) the plaintiff has adequate pleadings but fails to offer evidence in proof of each of the "four D's," or (3) the plaintiff has adequate pleadings and offers evidence on each of the "four D's," but on one or more it is insufficient to raise an issue of fact for submission to the jury. In each of these cases, by filing a motion for an instructed verdict at the close of the evidence the defendant may win the case in the trial court through failure of the plaintiff to make out his prima facie case.

It is hoped that the foregoing analysis is not obscure or overtechnical. It is only in accepting the challenge of the law in action that one can grasp the true nature of the judicial process.

(To be continued)

8. Contrast this with the English rule. A negligently operated tramcar collided with a hearse carrying a coffin containing a corpse on its way to the cemetery. The hearse was damaged and there was imminent danger that the coffin would be thrown on the pavement. The spectacle caused nervous "shock" to four relatives of the decedent who were following behind in the funeral cortege. The trial court denied recovery, but the Court of King's Bench held that plaintiffs could recover damages. "Nervous shock, if caused by the defendants' negligent act, is just as really damage to the sufferer as a broken limb." (*Owens* v. *Liverpool Corporation* [108 L. J. K. B. 155, 1939, 1 K. B. 394]).

GLANDULAR PHYSIOLOGY AND THERAPY

THE ADRENOGENITAL SYNDROME

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NEW YORK

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The advances made in adrenal and sex endocrinology during the past decade have materially broadened and to some extent rationalized our conceptions about the essential nature of the adrenogenital syndrome. In keeping with the general intent of this series, the endocrinologic and biochemical aspects have been preferentially treated in this article, at the expense of the clinical and pathologic features. A brief description of the latter aspects will suffice as a background for the topics more specifically discussed here.[1]

The adrenogenital syndrome in the broadest sense of the term comprises all conditions in which the abnormal changes in the sexual sphere are referable to organic or functional disturbances in the adrenal cortex. It is far more frequently seen in females, in whom the changes consist in the appearance of the male secondary sex characteristics and the repression of female characters and function: adrenal virilism. In general, the earlier in life the lesion develops, the more pronounced is the masculinization; hence in very young children, in whom the damage is probably prenatal, the picture is that of pseudohermaphroditism of various degrees, so that there is often some doubt about the true sex. If the onset occurs later in prepubertal life, the masculinization is usually less complete, and may overlap with signs of isosexual precocious maturity (enlargement of clitoris and labia majora, appearance of pubic hair and hirsutism, and sometimes also growth of breasts and appearance of menstruation). It is only natural that in many cases in which the imbalance is of a more latent character the onset of puberty is required to bring the maleness in appearance (contour of body, distribution of hair, failure of breasts to develop) into full prominence. Menstruation remains in abeyance. If the syndrome becomes established after normal puberty, or later in life, hirsutism is usually the first change noted, followed by irregularity or cessation of the menstrual cycle, changes in the body contour and usually mammary atrophy and enlargement of the clitoris.

In males the juvenile form of the syndrome gives rise to precocious sexual maturity with genital enlargement and hirsutism, often associated with rapid increase in stature and muscular development, or with obesity. In adult men the disease is rare, and then the tendency is more frequently toward feminization, with enlargement of the breasts and genital atrophy, than toward increased virility.

1. Recent books and reviews that may be consulted in this connection are: (*a*) Grollman, Arthur: The Adrenals, Baltimore, Williams & Wilkins Company, 1936. (*b*) Young, H. H.: Genital Abnormalities, Hermaphroditism and Related Adrenal Diseases, Baltimore, Williams and Wilkins Company, 1937. (*c*) Broster, L. R.; Allen, C.; Vines, H. W. C.; Patterson, J.; Greenwood, A. W.; Marrian, G. F., and Butler, G. C.: The Adrenal Cortex and Intersexuality, London, Chapman and Hall, 1938. (*d*) Haymaker, Webb, and Anderson, Evelyn: The Syndromes Arising from Hyperfunction of the Adrenal Cortex: The Adrenogenital and Cushing's Syndromes—A Review, Internat. Clin. **41**:245 (Dec.) 1938. (*e*) Cahill, G. F.: The Adrenogenital Syndrome and Adrenocortical Tumors, New England J. Med. **218**:803 (May 12) 1938.

Besides the changes in the sexual sphere and the acne of the face, back and chest, which is almost invariably present, other less constant features occur with various degrees of frequency. Such are obesity or abnormal distribution of fat, purple striae, hypertension, osteoporosis and frank or latent diabetes. All the latter conditions are also encountered in Cushing's syndrome (basophil adenoma of the pituitary). The original definition of this syndrome lists among its symptoms genital dystrophy and depression of sexual functions but not signs of sex reversal, such as virilism; later, however, it became increasingly clear that no sharp line of demarcation could be drawn between this condition and the adrenogenital syndrome proper. The frequent findings of malignant adrenocortical tumors in cases of either condition add to the difficulty of classification. There has been an increasing tendency in recent years to ascribe the symptoms of Cushing's disease to a primary hyperfunction of the adrenal cortex, while others adhere to the original view, which holds that the fundamental endocrine disturbance is in the pituitary. Whatever interpretation may be correct, there is hardly any doubt that the adrenal cortex is somehow involved in most, if not all, cases of this syndrome. This is probably true also of the "diabetes of bearded women," first described by Achard and Thiers, in which the chief symptoms are hirsutism of the face, irregularity or absence of menstruation, obesity and glycosuria. Since other features of Cushing's disease are frequently present, the condition is now usually regarded as a variation of the latter syndrome.

The condition of the adrenal cortex in the adrenogenital syndrome bears no definite relation to the type and severity of the symptoms. The gland may be grossly normal, slightly or considerably hyperplastic or, more rarely, may be adenomatous or carcinomatous. The reported absence of structural abnormalities, as well as the fact that adrenal hyperplasia is a relatively common finding entirely apart from the syndrome, makes it necessary to assume that the disturbance in these cases arises on a functional rather than on a structural basis. The often confirmed remission of the symptoms after unilateral adrenalectomy when the removed gland was normal in size or only slightly enlarged seems to justify this view. Neither do all neoplasms of the cortex give rise to sexual changes. Among the symptom-producing tumors, malignant carcinoma predominates. This type of tumor is found in cases of juvenile and adult virilism, of isosexual precocity in boys and girls, of feminization in adult males and of Cushing's syndrome. It is clear from this that cortical neoplasms may cause changes in the direction of masculinity as well as of femininity, which has led to the distinction, on purely clinical grounds, between androgenic and estrogenic tumors.

Grollman,[1a] who has denied the existence of estrogenic tumors, postulated that all masculinizing tumors arise from a special "androgenic" tissue, which is functionally distinct from the rest of the cortex. In fetal and early postnatal life this tissue comprises a part of the reticular zone; later it undergoes involution and then is confined to a thin juxtamedullary layer or merely a few scattered cells in this location. More recently, however, the author seems to have discarded this hypothesis (Gersh and Grollman[2]) and now attributes virilism either to the inclusion on the cortex of testicular rests which become functional or to a derangement in steroid metabolism resulting in the formation of androgens. Vines and co-workers[1c] have attempted to correlate virilism with the presence of histologic elements showing an abnormal (red) staining reaction with the ponceau fuchsin stain. The fuchsinophil material is not confined to any particular cell type, nor to the juxtamedullary zone, and therefore does not seem to bear any relationship to Grollman's androgenic tissue. In the series of Broster and Vines the reaction was positive in normal-sized and hyperplastic adrenals in 34 of 36 cases of virilism. Among the tumors, only those causing masculinizing symptoms gave the reaction. These observations have been confirmed by others, though Cahill[3] could find an excess of fuchsinophil material only in carcinoma, and not in adenomatous or non-neoplastic glands.

ENDOCRINE BASIS OF THE ADRENOGENITAL SYNDROME

An interesting theory concerning the influence of the adrenal cortex on sexuality has been developed by Vines and co-workers,[1c] based chiefly on a study of the fuchsinophil reaction in human fetal adrenals, which cannot be rendered here in detail. In brief, the cortex is conceived as "a potentially bisexual accessory sex gland, largely controlled by the pituitary and capable of secreting simultaneously androgens or estrogens, the one or the other being in excess." In the fetal adrenals of both sexes there occurs an androgenic phase shortly after the differentiation of the gonads and accessory sex organs has been completed. In the female this phase is of much shorter duration than in the male, but it nevertheless "interrupts the continuity of development along female lines and thereby introduces an element of instability," while in the male it serves to reenforce and stabilize the genetic maleness. In the female an overproduction of adrenal androgen during the androgenic phase or a failure of the latter to be terminated by inhibitory influences normally present (pituitary?) may then lead to various degrees of fetal masculinization. If the androgenic factor becomes dominant early in fetal life (before the twentieth week), the female gonad itself, which is then still in a plastic state, may become inverted (pseudohermaphroditism). Adolescent virilism is conceived as resulting from later fetal masculinization, which does not affect the gonad, and remains latent till puberty. Other forms of the syndrome are simply referable to an overproduction of adrenal androgenic or estrogenic factors, with the primary stimulus either residing in the gland itself (tumors) or in the pituitary (Cushing's syndrome).

The fundamental premise of this hypothesis, namely, that the adrenal can elaborate androgens and estrogens, is now well established by chemical research. There is also some reason to believe that this secretion is subject to, if not necessarily regulated by, stimuli from the pituitary. The exact mechanism involved in the pathologic overproduction of these hormones can only be guessed. The existence in the cortex of a special tissue secreting sex hormones which is stimulated to overfunction in disease must be regarded as highly hypothetic. The substances responsible for the symptoms may be formed by some aberration of cortical steroid metabolism; or, since there is evidence that the gland normally gives rise to androgens and perhaps estrogens, the pathologic change may consist merely in an increased rate of production. There are indications that the metabolism of cortical steroids, other

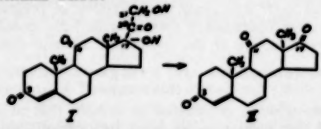
2. Gersh, I., and Grollman, Arthur: The Relation of the Adrenal Cortex to the Male Reproductive System, Am. J. Physiol. **126**: 368 (June) 1939.

3. Cahill, G. F.: Adrenal Cortical Syndromes and Adrenal Tumors, Tr. Am. A. Genito-Urin. Surgeons **31**: 111, 1938.

than androgens, is affected in virilism. Indeed, Haymaker and Anderson [4] expressed the opinion that Cushing's syndrome differs from the adrenogenital syndrome proper mainly in that overproduction of the cortical hormones acting on electrolyte and carbohydrate metabolism supervenes in the former and that of sex hormones in the latter. In support of this view they quoted their own findings on the presence of a life-maintaining factor in the blood and urine of patients with Cushing's disease,[4] on serum electrolyte changes in this disease which are opposite to those observed in adrenal cortex insufficiency,[5] and on the diabetes often associated with the syndrome.

ANDROGENS IN THE ADRENAL CORTEX

In 1936 Reichstein [6] isolated from beef adrenals an unsaturated triketone, adrenosterone (II), which exhibited androgenic potency in the capon comb test equivalent to one fifth of that of androsterone. More recently a saturated compound, structurally related to adrenosterone, 11-hydroxyisoandrosterone (formula II minus double bond, hydroxyl groups instead of keto groups at C_3 and C_{11}), was also found in the gland.[7] Its androgenic potency is only one thirtieth of that of androsterone.[8] Both these compounds have also been prepared in the laboratory by oxidative degradation of certain pregnane derivatives occurring in the adrenal cortex. The formation of adrenosterone from 11-dehydro-17-hydroxycorticosterone (I), a compound possessing weak life maintenance activity, is shown in the formulas below.



I II

The cleavage of the side chain can also be effected, as Mason [9] has shown, by weak alkali. It is conceivable that similar reactions resulting in the production of androgenic ketones may also occur biologically and that this represents the pathway by which the cortical steroids possessing the requisite groups at C_{17} and C_{20} are degraded in the organism. Pregnane compounds of this type, which thus, from the chemical point of view, may be considered as potential precursors of androgens, are relatively abundant among the steroids of the adrenal cortex. It is interesting in this connection that one of these compounds, the 17-hydroxyprogesterone recently isolated by Pfiffner and North,[10] is by itself androgenic, its potency in the rat test equaling that of androsterone. On oxidation it yields Δ_4-androstenedione, which, a close relative of testosterone, is still more effective in the castrated rat. This suggests that 17-hydroxyprogesterone may owe its androgenic properties to degradation in the treated animal to androstenedione, although it is of course equally possible that the original molecule may be androgenic as such.

EXCRETION OF SEX HORMONES AND RELATED STEROIDS IN THE ADRENOGENITAL SYNDROME

Androgens.—Owing to the expense and difficulty of the capon comb growth method of assaying urine for androgens, quantitative data on the excretion of these substances are yet too scant to permit satisfactory correlation with the clinical and pathologic observations. The colorimetric method when used, as by Callow,[11] with proper caution regarding procedure and interpretation may prove of great value in this respect. There is, however, some agreement on the point that malignant cortical tumors are often associated with inordinately high levels of androgen excretion regardless of the sex of the patient and the type of the symptoms. Of particular interest in this connection is a report by Crooke and Callow [12] on 2 cases of adrenal carcinoma classed as pituitary basophilism (the patients were a 25 year old man and a 6 year old girl); the authors contrasted the relatively enormous amounts of androgen excreted in these cases with the essentially normal amounts in 2 other cases of the syndrome not associated with adrenal tumor. But exceptions undoubtedly occur, as in a case of carcinoma listed by Kenyon and co-workers [13] in which the figure was not far above the normal range. Moderately elevated or essentially normal values of urinary androgen seem to prevail in cases of adolescent or adult virilism in which there is no evidence of a malignant tumor.[14] In the series of Broster, in which information about the condition of the gland was available through unilateral adrenalectomy, Patterson and Greenwood [14c] determined the so-called "free male hormone" (the androgenic substance extractable without previous acid hydrolysis of the urine), because this entity was found to be entirely absent from normal female urine. There was no particular correlation between the amounts of free androgen excreted and the size of the gland or the degree of virilism; however, in almost all cases in which free androgen was present, the gland showed a strong fuchsinophil reaction. The operation effected an immediate reduction of the free androgen in the urine and the virtual disappearance of this substance in later postoperative stages. Similarly, the excessive (total) androgen observed in cases of tumor of the adrenal was seen to decline to lower values after operation.[12]

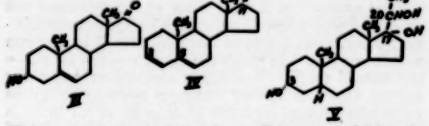
The androgen content of hyperplastic glands seems to be so low that in most cases it is not demonstrable at all (Patterson and Greenwood [14c]). Slot [15] found none, and Crooke and Callow [12] only comparatively small quantities of androgen (0.2 to 0.35 international unit per gram of non-necrotic tissue) in tumors which had given rise to excessive amounts in the urine.

4. Anderson, Evelyn, and Haymaker, Webb: Adrenal Cortical Hormone in Blood and Urine of Patients with Cushing's Disease, Proc. Soc. Exper. Biol. & Med. **38**:610 (June) 1938.
5. Anderson, Evelyn; Haymaker, Webb, and Joseph, Michael: Hormone and Electrolyte Studies of Patients with Hyperadreno-Cortical Syndrome (Cushing's Syndrome), Endocrinology **22**: 398 (Oct.) 1938.
6. Reichstein, T.: "Adrenosteron." Ueber die Bestandteile der Nebennierenrinde II, Helvet. chim. acta **19**: 223, 1936.
7. Reichstein, T., and von Euw, J.: Ueber Bestandteile der Nebennierenrinde: XX. Isolierung der Substanzen Q (Desoxycorticosteron) und R sowie weiterer Stoffe, Helvet. chim. acta **21**: 1197, 1938.
8. Reichstein, T.: Ueber Bestandteile der Nebennierenrinde: IV. Helvet. chim. acta **19**: 402, 1936.
9. Mason, H. L.: Chemical Studies of the Suprarenal Cortex: V. Conversion of Compound E to the Series Which Contains Four Atoms of Oxygen and to Adrenosterone by the Action of Calcium Hydroxide, J. Biol. Chem. **124**: 475 (July) 1938.
10. Pfiffner, J. J., and North, H. B.: 17-β-Hydroxyprogesterone, J. Biol. Chem. **125**: 459 (Feb.) 1940.
11. Callow, N. H.; Callow, R. K., and Emmens, C. W.: Colorimetric Determination of Substances Containing the Grouping $-CH_2CO-$ in Urine Extracts as an Indication of Androgen Content, Biochem. J. **32**: 1312 (Aug.) 1938.
12. Crooke, A. C., and Callow, R. K.: The Differential Diagnosis of Forms of Basophilism (Cushing's Syndrome) Particularly by the Estimation of Urinary Androgen, Quart. J. Med. **8**: 233 (July) 1939.
13. Kenyon, A. T.; Gallagher, T. F.; Peterson, D. H.; Dorfman, R. I., and Koch, F. C.: The Urinary Excretion of Androgenic and Estrogenic Substances in Certain Endocrine States: Studies in Hypogonadism, Gynecomastia and Virilism, J. Clin. Investigation **16**: 705 (Sept.) 1937.
14. (*a*) Levy Simpson, S.; de Fremery, P., and Macbeth, Alison: The Presence of an Excess of Male (Comb Growth and Prostate Stimulating) Hormone in Virilism and Pseudohermaphroditism, Endocrinology **20**: 363 (May) 1936. (*b*) Glass, S. J., and Bergman, H. C.: Subclinical Adrenogenital Syndrome, ibid. **22**: 625 (Nov.) 1938. (*c*) Callow, R. K.: The Significance of the Excretion of Sex Hormones in the Urine, Proc. Roy. Soc. Med. **31**: 841 (May) 1938. (*d*) Kenyon and others.[13]
15. Slot, W. J. B.: The Relation of Sex Hormones in a Case of Virilism by Hypernephroma, Acta med. Scandinav. **80**: 371, 1936.

Obviously, only an insignificant portion of the androgen produced is stored at the site of origin. This is reminiscent of the situation in normally functioning endocrine glands which produce steroid hormones (testis, ovarian follicle, corpus luteum).

Estrogens.—Abnormally high amounts of estrogen seem to be excreted sometimes in virilism with or without adrenal neoplasm [16] but more often in those cases of adrenal tumor classed as instances of Cushing's syndrome.[17] Frank [17a,b] considered inordinately high amounts (1,000 to 10,000 mouse units per day) as characteristic for cortical carcinoma, since he did not observe them in cases in which the gland was merely adenomatous or hyperplastic (Frank test). It has to be pointed out, however, that by no means all cases of carcinoma exhibited this feature,[18] so that only a strongly positive test may be regarded as diagnostically significant.

Excretion Products.—The excessive androgen titer of the urine examined chemically by Callow [19] in 2 cases of tumor was shown to be chiefly due to its content of dehydroisoandrosterone (III), which was isolated in extraordinarily high yields (110 and 60 mg. per liter).



III IV V

This author suggested that the small amounts of this substance excreted by normal men and women have their source likewise in the adrenal. A related compound, $\Delta_{5,6}$-androstadiene-17-one (IV), accounted roughly for the moderately increased urinary androgen in a case reported by Burrows and co-workers.[20] The patient was a man exhibiting symptoms of feminization, caused by a metastasized adrenal tumor. Since the compound was not found in the urine of patients with cancer in other locations, its derivation from the adrenal and not from the testes, which were atrophied, is fairly certain. The estrogen excretion in this case was very high (3,000 international units per liter). The compound concerned was in all probability estrone (theelin). The relative preponderance of the heterosexual hormone in this rare type of sex inversion is of interest.

From the studies of Butler and Marrian [21] it appears that the excretion of steroids in the syndrome is qualitatively as well as quantitatively altered from the normal. From the urine of patients with symptoms of virilism, caused by cortical hyperplasia, four steroids were isolated. One of these is a pregnane-3,17,20-triol (V) stereoisomeric with similar triols which occur in the gland itself (Reichstein). The authors definitely established the absence of this triol from the urine of normal men, and of normal and pregnant women; they also showed that it disappeared from the urine of the patients after removal of the hyperplastic gland. It is therefore an abnormal excretion product specifically associated with the syndrome and probably derived from the diseased gland. Later another triol of this type, stereoisomeric with the first, was isolated from the pathologic urines; furthermore, two stereoisomers of androsterone, isoandrosterone and 3α-hydroxyetiocholan-17-one, were present. It should be mentioned that among the four isolated compounds only isoandrosterone is known to be (weakly) androgenic; 3α-hydroxyetiocholanone, which was later shown to occur also in normal urine,[22] is physiologically inactive; and the two pregnanetriols should lack androgenic action for structural and stereochemical reasons.[23]

It was also noted by Butler and Marrian [23a] and by Venning, Weil and Browne [24] that their patients with virilism excreted pregnanediol. These patients had primary or secondary amenorrhea; the diol could therefore not have been derived, as in normal cyclic women, from the progesterone secreted by a functional corpus luteum. Since the adrenal cortex is known to elaborate progesterone,[25] and since the excretion of pregnanediol ceased after operation,[24] there can be little doubt as to the adrenal origin of the compound in these cases.

ADRENAL CORTEX AS A NORMAL SOURCE OF SEX HORMONES

It can now be considered as certain that at least a part of the androgens excreted by normal subjects is derived from an extragonadal source, which as far as present knowledge goes can be only the adrenal cortex. The urine of eunuchs and of ovariectomized women shows small but definite amounts of androgenic activity.[26] According to Callow,[16c] the figures may even overlap the normal range. Hirschmann [27] succeeded in identifying, by actual isolation, the androgens excreted by ovariectomized women as androsterone and dehydroisoandrosterone. The stereoisomer of the former, 3α-hydroxyetiocholan-17-one, which is physiologically inactive, was likewise present. The yields were only little lower than those reported by the Callows when they isolated the same three compounds from the urine of normal women [22a] and men.[22b] It would seem from

16. (a) Saphir, William, and Parker, M. L.: Adrenal Virilism, J. A. M. A. **107**: 1284 (Oct. 17) 1936. (b) McGavack, T. H.: Masculinizing and Non-Masculinizing Carcinomata of Cortex of Adrenal, Endocrinology **26**: 396 (March) 1940. (c) Levy Simpson and others.[16a]

17. Frank, R. T.: (a) A Suggested Test for Functional Cortical Adrenal Tumor, Proc. Soc. Exper. Biol. & Med. **31**: 1204 (June) 1934; (b) A Suggested Test for Cortical Adrenal Carcinoma, J. A. M. A. **109**: 1121 (Oct. 2) 1937. (c) Graef, Irving; Bunim, J. J., and Rottino, Antonio: Hirsutism, Hypertension and Obesity Associated with Carcinoma of the Adrenal Cortex, Arch. Int. Med. **57**: 1085 (June) 1936. (d) Hare, D. C.; Ross, J. M., and Crooke, A. C.: Cortical Carcinoma of the Suprarenal, Lancet **2**: 118 (July 20) 1935. McGavack.[16c]

18. Cahill, G. F.; Loeb, R. F.; Kurzrok, Raphael; Stout, A. P., and Smith, F. M.: Adrenal Cortical Tumors, Surg., Gynec. & Obst. **62**: 287 (Feb., no. 2A) 1936. Walters, Waltman, and Kepler, E. J.: Adrenal Cortical Tumors and Their Treatment, Ann. Surg. **107**: 881 (June) 1938. Crooke and Callow.[17d] Kenyon and others.[17c] Slot.[17c] Hare and others.[17d]

19. Crooke and Callow.[17d] Callow.[16c]

20. Burrows, H.; Cook, J. W.; Roe, E. M. F., and Warren, F. L.: Isolation of $\Delta_{5,6}$-Androstadiene-17-one from the Urine of a Man with a Malignant Tumor of the Adrenal Cortex, Biochem. J. **31**: 950 (June) 1937.

21. Butler, G. C., and Marrian, G. F.: The Isolation of Pregnane-3,17,20-triol from the Urine of Women Showing the Adreno-genital Syndrome, J. Biol. Chem. **119**: 565 (July) 1937; The Isolation of 3(α)-Hydroxyetiocholane-17-one, 3(β)-Hydroxyetiocholcholane-17-one (Isoandrosterone), and a New Triol from the Urine of a Woman with an Adrenal Tumor, ibid. **124**: 237 (June) 1938. "Hyperplasia" should be substituted for "tumor" in foregoing title; see correction in Nature, London, **142**: 400 (Aug. 27) 1938.

22. (a) Callow, Nancy H., and Callow, R. K.: The Isolation of 17-Ketosteroids from the Urine of Normal Women, Biochem. J. **33**: 931 (June) 1939. (b) Callow, Nancy H.: The Isolation of Two Transformation Products of Testosterone from Urine, ibid. **33**: 559 (April) 1939.

23. Recently Wolfe, Fieser and Friedgood published a careful quantitative study on the composition of the 17-keto steroid fraction from the urine of a girl with a corticoadrenal tumor. Androsterone was present in about the same amounts as in normal female urine (0.3 mg. per liter), while the levels of 3-α-hydroxyetiocholan-17-one (13 mg. per liter) and of dehydroisoandrosterone (88 mg. per liter) represented tenfold and hundredfold increases, respectively, above normal. Furthermore, Δ3,5-androstadien-17-one (25 mg. per liter) and 3-α-hydroxyandrosten-17-one, a new isomer of dehydroisoandrosterone in which the position of the double bond is still undetermined, were isolated. (Wolfe, J. K.; Fieser, L. F., and Friedgood, H. B.: Nature of the Androgens in Female Adrenal Tumor Urine, J. Am. Chem. Soc. **63**: 582 [Feb.] 1941.)

23a. Butler and Marrian.[21] Broster and others.[5c]

24. Venning, Eleanor H.; Weil, P. G., and Browne, J. S. L.: Excretion of Sodium Pregnanediol Glucuronidate in the Adrenogenital Syndrome, J. Biol. Chem. **128**: cvii (June) 1939.

25. Beall, D.: The Isolation of Progesterone and 3,20-Allopregnanolone from Ox Adrenals, Biochem. J. **32**: 1957 (Nov.) 1938.

26. Literature in Parkes, A. S.: Source of Androgenic and Oestrogenic Substances in the Urine, Lancet **2**: 902 (Oct. 16) 1937.

27. Hirschmann, H.: Androgens from the Urine of Ovariectomized Women, J. Biol. Chem. **130**: 421 (Sept.) 1939; **136**: 483 (Nov.) 1940.

these results that the contribution of the adrenal to the normal excretion of androgen is much greater than was hitherto suspected.[27a]

The presence of residual estrogenic activity in the urine of male and female castrates [26] invites an analogous interpretation. The possibility that these small quantities may be derived from foodstuffs appears to have been ruled out by Eng.[28] The ability of the adrenal cortex to elaborate, if not to secrete, estrogens cannot be doubted, since crystalline estrone (theelin) has been isolated from beef glands.[29]

The still controversial question whether the adrenal cortex, with its potential faculty to secrete androgens and estrogens, actually plays a part, beside the gonads, in the regulation of normal sex functions must be treated here summarily. Gersh and Grollman [2] denied any normal "androgenic function" on the ground that the effect of castration on the accessory sex organs of male rats and mice is not modified by the absence of the adrenal, but this has been disputed by Burrill and Greene,[30] who contend that the partial maintenance, in early prepubertal life, of the ventral prostate of the young castrated rat is due to an androgenic secretion from the adrenals. A positive response of the accessory organs was also observed by Hodler [31] in castrated male guinea pigs receiving beef adrenal implants or extracts. Furthermore, Davidson and Moon [32] were able to produce significant enlargement of the seminal vesicles and prostates of castrated rats by means of adrenotropic anterior pituitary preparation, which also caused hypertrophy of the adrenal cortices. Since the effect could not be elicited in the absence of the adrenals, it is clear that this gland had been stimulated to secrete an androgenic principle. Similar results have been obtained by Hodler [31] in male guinea pigs, while in normal and ovariectomized females a masculinizing effect (hypertrophy of the clitoris) was observed. That a secretion of estrogens may be evoked by the same stimulus would appear from the experiments of Moon,[33] who induced vaginal opening and signs of estrus in immature spayed rats by administration of an adrenotropic extract.

It must be conceded that all these results, except perhaps those of Burrill and Greene, reveal a potential availability rather than an active, functional secretion of androgens and estrogens from the adrenal cortex. Further work is needed to clarify this issue. At any rate it would not seem, from the present evidence, that these secretions play an important part functionally in the normal adult organism. The biochemist is perhaps tempted to take the more limited view that they are incidental by-products of cortical steroid metabolism, which, to judge from the number of compounds isolated from the gland (most of which are physiologically inactive), seems to be highly complex and ramified.

27a. This is true also of the androgen excretion in males, since the Callows later demonstrated the presence of the aforementioned compounds in the urine of eunuchs. The level of dehydroisoandrosterone equaled that of normal male urine, while the excretion of the other two steroids was lower than in normal males. The data gives support to Callow's earlier suggestion that dehydroisoandrosterone, at any rate, may be wholly derived from the adrenals. (Callow, H. N., and Callow, R. K.: Biochem. J. **34**: 276 [March] 1940.)

28. Eng, H.: Follikelin im kastrierten Organismus, Klin. Wchnschr. **15**: 349 (March 7) 1936.

29. Beall, D.: Isolation of Oestrone from the Adrenal Glands, Nature, London **144**: 76 (July 8) 1939; J. Endocrinology **2**: 81 1940.

30. Burril, M. W., and Greene, R. R.: Further Studies on the Andromimetic Function of the Immature Rat Adrenal, Endocrinology **26**: 645 (April) 1940.

31. Hodler, D.: Surrénales et masculinisation, Arch. d'anat., d'histol. et d'embryol. **24**: 1, 1937.

32. Davidson, C. S., and Moon, H. D.: Effect of Adrenocorticotropic Extract on Accessory Reproductive Organs of Castrated Rats, Proc. Soc. Exper. Biol. & Med. **35**: 281 (Nov.) 1936; Davidson, C. S.: ibid. **36**: 703 (June) 1937.

33. Moon, H. D.: Effect of Adrenocorticotropic Hormone on Sexual Development of Spayed Rats, Proc. Soc. Exper. Biol. & Med. **37**: 36 (Oct.) 1937.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

OFFICE OF THE COUNCIL.

KINNEY'S YEAST EXTRACT CONTAINING VITAMIN B COMPLEX (See New and Nonofficial Remedies, 1940, p. 524).

The following dosage form has been accepted:

Kinney's Yeast Extract (Vitamin B Complex) Tablets, 5 grains: Each tablet contains not more than 50 international units of thiamine hydrochloride and not less than 25 Sherman-Bourquin units of riboflavin.

Manufactured by the Scientific Sugars Company, Columbus, Ind.

NICOTINIC ACID AMIDE (See New and Nonofficial Remedies, 1940, p. 526).

The following product has been accepted:

Nicotinic Acid Amide-Upjohn.—A brand of nicotinic acid amide-N. N. R.

Manufactured by the Upjohn Company, Kalamazoo, Mich. No U. S. patent or trademark.

Tablets Nicotinic Acid Amide-Upjohn, 50 mg.

SODIUM CITRATE 2½% W/V IN PHYSIOLOGICAL SOLUTION OF SODIUM CHLORIDE IN CENTRI-VAC CONTAINER-BAXTER.—A sterile 2.5 per cent solution of sodium citrate in physiological solution of sodium chloride contained under reduced pressure of approximately 8 cm. of mercury in a specially adapted bottle which can be equipped with a special valve to regulate the inflow of liquids.

Actions and Uses.—An anticoagulant in a special container for the separation of plasma from whole blood by centrifugation or sedimentation and for the indirect transfusion of citrated whole blood. After aspiration of blood from the donor's vein to the container, it is mixed with the citrate and the cells are allowed to separate for the preparation of plasma. The container is also suitable for the indirect transfusion of the citrated blood. The plasma is transferred to another container for dilution, storage and administration.

Dosage.—35 cc. of the solution is used for each 250 cc. of whole blood.

Manufactured by Baxter Laboratories, Inc., Glenview, Ill. (American Hospital Supply Corporation, Chicago, distributor.) Produced and distributed in eleven Western states by Don Baxter, Inc., Glendale, Calif. U. S. patent 2,108,583.

Sodium Citrate 2½% W/V in Physiological Solution of Sodium Chloride in Centri-Vac Container-Baxter, 15 cc. in 300 cc. Bottle: Contains 2.5 per cent sodium citrate in physiological solution of sodium chloride.

Sodium Citrate 2½% W/V in Physiological Solution of Sodium Chloride in Centri-Vac Container-Baxter, 35 cc. in 300 cc. Bottle. Contains 2.5 per cent sodium citrate in physiological solution of sodium chloride.

PHYSIOLOGICAL SOLUTION OF SODIUM CHLORIDE (See New and Nonofficial Remedies, 1940, p. 379).

The following product has been accepted:

PHYSIOLOGICAL SOLUTION OF SODIUM CHLORIDE IN PLASMA-VAC CONTAINER-BAXTER.—A sterile isotonic solution of sodium chloride contained under reduced pressure of approximately 12 cm. or 30 cm. of mercury in specially adapted bottles which can be equipped with a special valve to regulate the inflow of liquids.

Actions and Uses.—The solution is used as a diluent in a special container for the aspiration, storage and administration of blood plasma obtained by centrifugation or sedimentation of citrated whole blood.

Dosage.—Two hundred and fifty cc. of the solution is used to dilute 250 cc. of plasma.

Manufactured by Baxter Laboratories, Inc. (American Hospital Supply Corporation, Chicago, distributor). Produced and distributed in eleven Western states by Don Baxter, Inc., Glendale, Calif. U. S. patent 2,108,853.

Physiological Solution of Sodium Chloride-Baxter, 250 cc. in 500 cc. container.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1940, p. 528).

The following dosage forms have been accepted:

Mead's Thiamine Hydrochloride Tablets, 0.75 mg. Prepared by Mead Johnson and Co., Evansville, Ind.

Mead's Thiamine Hydrochloride Tablets, 3 mg. Prepared by Mead Johnson and Co., Evansville, Ind.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 14, 1941

THE CLEVELAND SESSION

An inundation of physicians beyond the capacity of the available hotels in Cleveland marked the annual session of the American Medical Association for 1941. The attendance was *7,269*, more than twelve hundred above the attendance in the same city in 1934. Even the use of a boat with a tremendous capacity moored on the lake front failed to satisfy the desire for accommodations. The problem of selecting a place for the annual session that is capable of providing sufficient hotel rooms to meet the desire of American physicians who attend the annual sessions of the American Medical Association is one which now taxes the resources of our great cities. There is obvious need in the United States for some of our largest metropolitan centers to provide auditoriums such as those available in Atlantic City, and there is also need for the smaller communities which have such large auditoriums to make available sufficient hotel space to accommodate the numbers who now attend many large conventions.

Conspicuous in the Cleveland session were the exhibits. The unanimous encomiums by physicians who spent many hours in attendance on both the scientific and the technical exhibits are proof of the tremendous value attached to these features. Invariably the doctors said that the scientific exhibits offered the greatest concentrated postgraduate education in medicine made available anywhere in this or any other country. The scope of the exhibits, the perfection of organization, the attractiveness of the displays and the earnestness of the physicians who demonstrated were, no doubt, largely responsible for the enthusiasm. Since the time when Drs. Frank Wynn and Frank Billings first gave their personal attention to this development there has been steady progress toward the practical perfection now achieved.

The scientific sessions merit particular mention. The new Section on Anesthesiology justified its existence with attendance varying between one hundred and fifty and two hundred and with an excellent program. The general scientific meetings included the clinical session, which was received with approbation, a special session on infantile paralysis in which the National Foundation for Infantile Paralysis cooperated, and a meeting on medical preparedness in which all the official agencies of the government and other agencies were well represented. In many of the sections the traditional scientific contributions were varied by panel discussions, round tables and similar meetings, indicating that the Council on Scientific Assembly and the officers of the sections are alert to the adoption of new technics in medical teaching.

The problems which confronted the House of Delegates were largely military, social and economic, but there were also evidences of concern of the House with problems of scientific advancement. The medical profession is ready, through the work of the Committee on Medical Preparedness, to meet the needs of the government and of civilian agencies for medical service. Obviously, as the House recommended, some central assignment authority must be developed, having available a full knowledge of the medical resources of the country, to distribute medical personnel to meet all the various needs. Continuity of medical education is absolutely essential to maintenance of an adequate supply of physicians for all these purposes. Largely discussed also was the situation now created by the certifying boards in the specialties and by some of the activities of the Advisory Board created by these certifying boards. The resolutions on this subject and the discussion associated with their presentation and consideration indicated how essential is thorough consideration before taking further action in this field. Indeed, the Council on Medical Education and Hospitals of the Association was specifically requested by the House of Delegates to manifest leadership in aiding the work of these certifying boards so that they function primarily for the good of the people and for the advancement of medical science and avoid the tendency toward the establishment of guilds which in some instances seems to prevail. The various resolutions offered on this subject will be published as part of the proceedings of the annual session, which begin in this issue of THE JOURNAL.

Especially significant was the action taken by the House of Delegates to establish a Committee on Pan American Relationships, which is to be concerned with the establishment of scientific interchange with the medical societies of our South American, Mexican, Cuban, Puerto Rican and Canadian colleagues. The annual session for 1942, to be held in Atlantic City, has been announced as a Pan American session to which distinguished representatives of the other American nations

will be asked to send representatives, exhibits and, indeed, to participate as much as possible. The Council on Scientific Assembly is charged by the Association with the development of the scientific aspects of this session.

Noteworthy among the social functions of the 1941 session were the opening general meeting, which was held in the Music Hall under perfect conditions and which included addresses by distinguished clergymen, the governor of Ohio, the mayor of Cleveland and the officials of the Association, and the President's reception in the Hotel Cleveland, largely attended and with ideal arrangements for this delightful function, and the golf tournament, with the largest registration in its history. The dinners given to the Board of Trustees and the House of Delegates by the Ohio State Medical Association and the Cleveland Academy of Medicine were on a dignified plane, again perfectly arranged with the provision of delightful entertainment and exceptional cuisine.

The House of Delegates voted in executive session without a dissenting vote to carry onward the trial of the case of the United States government versus the American Medical Association et al., so that a decision may be had from the highest courts as to the place which organized scientific medicine is to occupy in our economy. The unity of the action taken, the careful consideration given to every problem presented, the insight into the affairs of medical practice in the United States testified to the extraordinarily high character of the representation in the House of Delegates, the body which is charged by the American Medical Association with the establishment of its policies.

The 1941 session witnessed the end of the term of service of Dr. Thomas Cullen as a member of the Board of Trustees, a service which he has rendered as a contribution to the advancement of medicine for the past twelve years. In his place comes Dr. Charles W. Roberts of Atlanta, Ga., for some time a member of the House of Delegates and of the Council on Industrial Health. The death of Dr. Fred Moore and the election of Dr. Fred Rankin to the presidency brought about two vacancies on the Council on Medical Education and Hospitals. For these positions the Board of Trustees nominated several distinguished physicians, from whom the House of Delegates elected Drs. Harvey B. Stone of Baltimore and Russell Haden of Cleveland. In the development of American medical practice this Council's part is now so vital that these additions to the membership are considered especially fortunate.

Thus passed the annual session of 1941—a credit to the Local Committee on Arrangements and to the city in which it was held; a credit to the official bodies of the Association who were charged with the creation of the exhibits and the handling of its affairs; a credit, indeed, to all who participated.

PROFESSIONAL TESTIMONIALS [?]

The Bureau of Investigation of the American Medical Association has always contended that testimonials, whether of doctors or of laymen, are of little scientific value. Frequently a monetary exchange influences a testimonial, in its opinion.

An orthopedic surgeon in Chicago recently received a letter on the stationery of the Scholl Manufacturing Company of Chicago which reads:

"Dear Sir: It is our intention to make a clinical investigation of some of our foot preparations and we would like to know if you are willing to do this work for us.

"Due to your wide experience in this field, we would greatly appreciate getting affidavits from you and learning your fee for these medical reports.

"These affidavits should contain the extent of your investigations and a sanction in regard to our claims, as well as the effectiveness of these products.

"If you do decide to make this clinical investigation, will you please drop a note to Dr. Einstoss, so that an appointment can be arranged for a time that will be mutually agreeable."

Apparently the Scholl Manufacturing Company fails to recognize that statements obtained in this manner do not constitute acceptable scientific evidence on which to devise claims for products.

Perhaps there is no relationship between the request and the statement issued on Dec. 8, 1940 by the Federal Trade Commission:

"Scholl Manufacturing Company, Inc., 211 West Schiller St., Chicago, engaged in the manufacture and distribution of devices known as 'Dr. Scholl's Zino-Pads' and 'Dr. Scholl's Kurotex Foot Plasters,' designed for the treatment of corns, bunions and other foot ailments, has been ordered by the Federal Trade Commission to cease and desist from certain misrepresentations of the products.

"The respondent is ordered to cease and desist from disseminating or causing to be disseminated any advertisement in commerce which represents, directly or through inference, that the use of 'Dr. Scholl's Zino-Pads' stops pain instantly or in one minute; that corns or callouses can be lifted out after the application of 'Dr. Scholl's Zino-Pads' without the use of surgery or other aids; that the use of 'Dr. Scholl's Zino-Pads' is a cure or remedy for corns, callouses or bunions; that 'Dr. Scholl's Zino-Pads' have healing properties; or that the use of 'Kurotex Foot Plasters' instantly relieves the pain caused by corns, sore toes, callouses, bunions or tender spots on the feet caused by new or tight shoes, or gives any degree of relief from such condition in excess of that which follows from the protection from outside pressure and friction, or gives any relief from such conditions except during the time that the 'Kurotex Foot Plasters' are worn."

Current Comment

FOURTH OF JULY FIREWORKS INJURIES

This year, as in the previous four years, the American Medical Association is circularizing hospitals, dispensaries and other institutions in the United States with a view to compiling a record of the deaths and injuries resulting from celebration of the Fourth of July with fireworks. As the result in large part of these annual summaries, several states have adopted effective antifireworks legislation. The number of deaths from this cause has been reduced therefore in 1940 to 8 as compared with 20 in 1937. The total number of injuries has been reduced from 7,205 in 1937 to 4,462 in 1940. Although the improvement is considerable, it is still obvious that there can be no relaxation of effort in the attempt to prevent such unnecessary accidents. Hospitals throughout the country are again asked to cooperate in the careful filling out and prompt return of the questionnaires which they will shortly receive in order that a still further improvement in the situation may be brought about.

FRED WHARTON RANKIN—PRESIDENT-ELECT

Again a surgeon of international repute has been elected by the House of Delegates of the American Medical Association to the highest honor in the province of scientific medicine. Again the House of Delegates recognized service to organized medicine: the physician selected is one who has participated notably in the affairs of the American Medical Association and of many other scientific bodies. Dr. Rankin was born in Mooresville, N. C., on Dec. 20, 1886. After receiving his bachelor of arts degree from Davidson College in 1905 he received his degree of doctor of medicine from the University of Maryland in 1909 and the degree of master of arts from St. John's College in 1913. He was also made honorary doctor of sciences by Davidson College, his alma mater, in 1937, and honorary LL.D. by the University of Maryland in 1939. Following his graduation in medicine he became a resident surgeon at the University Hospital in Baltimore from 1909 to 1912 and served as assistant demonstrator of anatomy and associate in surgery at the University of Maryland Medical School from 1913 to 1916. He then joined the Mayo Clinic in Rochester, Minn., acting as assistant surgeon at St. Mary's Hospital, 1916-1923. He was professor of surgery at the University of Louisville, 1922-1923, and served as surgeon to the Mayo Clinic and as associate professor at the University of Minnesota Medical School, Mayo Foundation, 1926-1933. He then removed to Lexington, Ky., where he became surgeon to St. Joseph's and the Good Samaritan hospitals, with which he has been associated since Jan. 1, 1934. In the World War Dr. Rankin served as a major in the Medical Corps for seventeen months and was attached to the First Army Corps, 4th and 26th divisions in France, as commanding officer of Base Hospital No. 26. He is now a colonel in the Medical Reserve Corps. He has been honored by many medical organizations, including the presidency of the Southern Surgical Association and the Southeastern Surgical Congress. He is a fellow of the American College of Surgeons and a member of the American Surgical Association, American Proctologic Society, Eastern and Western Surgical associations, Southern Medical Association and many surgical clubs and medical fraternities. He was one of the founder members of the American Board of Surgery, representing in that body the Section on Surgery of the American Medical Association. His contributions to medical literature include a monograph on "Surgery of the Colon"; a work on "The Colon, Rectum and Anus," published in 1932 jointly with Drs. J. A. Bargen and L. A. Buie, and a work on "Cancer of the Colon and Rectum," published with Dr. A. S. Graham in 1939. He has also contributed chapters on surgery of the colon, with particular reference to carcinoma, in several systems of surgery. In the American Medical Association Dr. Rankin has been especially active. He was a member of the House of Delegates, representing the Section on Surgery from 1935 through 1940. On several occasions he has aided in the work of the reference committees. In 1936 he was appointed to the membership of the Council on Medical Education and Hospitals, and he has been active in the work of that body. He was appointed by the speaker of the House of Delegates a member of the Committee on Medical Preparedness in 1940 and has been assiduous in the duties of that committee and especially in military preparedness in the Fifth Corps Area. In 1923 Dr. Fred W. Rankin married Miss Edith Mayo, a daughter of Dr. Charles H. Mayo, and he has four children: Frederic Wharton, Edith Graham, Charles Mayo and Thomas Alexander. Almost immediately following his election he was deluged with invitations to attend many meetings of state and other medical organizations, indicating not only his popularity with the medical profession but his devotion to the work of organized medicine.

FRED W. RANKIN, M.D.
PRESIDENT-ELECT OF THE AMERICAN MEDICAL ASSOCIATION

THE DISTINGUISHED SERVICE MEDAL

To the distinguished names of Rudolph Matas, surgeon, James B. Herrick, internist, and Chevalier Jackson, otolaryngologist, the House of Delegates added that of Dr. James Ewing of New York, world famed as a pathologist, as the recipient of the Distinguished Service Award of the American Medical Association for 1941. Although 74 years of age, Dr. Ewing came at once from New York to be present on the platform at the opening session to receive the Distinguished Service Medal in person. To repeat the record of his career is almost unnecessary, since he is widely known on several continents. Dr. James Ewing was born in Pittsburgh on Christmas day, 1866. He received his bachelor's degree from Amherst in 1888 and his master of arts degree in 1891. Following his funda-

mental education, he attended the College of Physicians and Surgeons of New York, now known as Columbia University College of Physicians and Surgeons, and received his degree of doctor of medicine in 1891. He has also been honored with honorary degrees of doctor of science by the University of Pittsburgh in 1911, by Amherst in 1923, by the University of Rochester in 1932 and by Union College in 1938 and with the LL.D. degree by Kenyon College in 1931 and by Western Reserve University in the same year. Early in his medical career Dr. James Ewing determined to devote himself to the fundamental sciences. He was a tutor in histology, 1893-1897, and had the Clark fellowship, 1896-1899. He then became instructor in clinical pathology at the Columbia College of Physicians and Surgeons, 1897-1898; he was professor of pathology, from 1899-1932, at Cornell University Medical College and since 1932 has been professor of oncology. Indeed it is his fundamental work in the field of cancer that has made him most famous. Among other positions which he has occupied are the directorship of the Memorial Hospital in New York City. He is a member of such scientific organizations as the National Academy of Sciences, the Association of American Physicians, the American Roentgen Ray Society, the American Association of Pathologists and Bacteriologists, the Society of Experimental Biology and Medicine, the Harvey Society, the American Association for Cancer Research and the American Medical Museum Society. In 1931, when he was head of the department of pathology at Cornell University Medical College, Dr. Ewing was honored with a dinner and with a testimonial volume including fifty-four articles on cancer written by authorities from all over the world. On that occasion messages were sent by President Hoover, Gov. Franklin Delano Roosevelt and Madame Curie, as well as many others. In 1936 he received the John Scott Award, consisting of a bronze medal and $1,000, from the Philadelphia Board of City Trusts for his research in classifying tumors. He was appointed in 1937 a member of the National Advisory Cancer Council, and he has been a member of many other committees in this field. In 1940 he received the Clement Cleveland Medal of the New York City Cancer Committee. His literary contributions include "Clinical Pathology of the Blood," published in 1900; his textbook on legal medicine published in 1910, and his work on "Neoplastic Diseases," first published in 1919. His writings include also innumerable contributions to systems of medicine and to scientific periodicals. As he received the medal from the hands of President Frank Lahey, Dr. Ewing paid a tribute to organized medicine, complimenting the American Medical Association on its devotion to scientific advancement and pointing out that during his fifty years of membership in the medical profession he had observed a continued advancement, so that American medicine occupies today a position of recognized leadership in the scientific medicine of the world. Dr. Ewing stated also that it was his belief that this position of leadership was a result of the inspiration and freedom of action associated with a truly democratic system of government.

FRANK H. LAHEY, M.D., PRESIDENT OF THE AMERICAN MEDICAL ASSOCIATION, PRESENTING THE DISTINGUISHED SERVICE MEDAL TO JAMES EWING, M.D.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

BARCOMB, Albert E., Lieut., M. R. C., Rochester, N. Y., Camp Forrest, Tenn.
BURNESS, Sidney H., 1st Lieut., West Hartford, Conn., Manchester, N. H.
CARROLL, Francis B., 1st Lieut., Great Barrington, Mass., Fort Devens, Mass.
CHESTER, Lewis, 1st Lieut., New Britain, Conn., Hartford, Conn.
CROSKERY, William F., 1st Lieut., Milton, Mass., Hartford, Conn.
CUTLER, Isadore L., 1st Lieut., Rutland, Mass., Fort Devens, Mass.
DURHAM, Richard A., 1st Lieut., Ipswich, Mass., Fort Devens, Mass.
DURLACHER, Stanley H., Lieut., M. R. C., New Haven, Conn., Camp Forrest, Tenn.
DYE, William J. P., 1st Lieut., Wolfeboro, N. H., Manchester, N. H.
EASTMAN, Oliver R., Lieut., M. R. C., Burlington, Vt., Camp Forrest, Tenn.
FAGAN, Frederick J., 1st Lieut., Boston, Maxwell Field, Ala.
FAILLA, Samuel D., 1st Lieut., Greenfield, Mass., Maxwell Field, Ala.
FINBERG, Meyer H., Major, Boston, Fort Devens, Mass.
FISHBEIN, Jay N., 1st Lieut., Providence, R. I., Maxwell Field, Ala.
FOSTER, Clarence B., 1st Lieut., Greensboro, Vt., Fort McClellan, Ala.
GARIPAY, Stanley L., 1st Lieut., Hartford, Vt., Manchester, N. H.
GELLER, Philip S., 1st Lieut., Newport, R. I., Hartford, Conn.
GOODALL, Edwin B., Lieut., M. R. C., Newton Centre, Mass., Camp Forrest, Tenn.
GURALNICK, Eugene A., Lieut., M. R. C., Roxbury, Mass., Camp Forrest, Tenn.
HADLER, Arthur J., 1st Lieut., Boston, Camp Edwards, Mass.
HAGOPIAN, Peter B., 1st Lieut., Danvers, Mass., Fort Devens, Mass.
HAJJAR, Solomon G., 1st Lieut., North Billerica, Mass., Fort Devens, Mass.
HANSELL, Howard R., 1st Lieut., Sharon, Conn., Fort Devens, Mass.
HARRIS, Max, 1st Lieut., St. Albans, Vt., Fort Devens, Mass.
HILL, Edwin V., 1st Lieut., Lexington, Mass., Fort Barrancas, Fla.
HOLMES, Everett B., 1st Lieut., Ludlow, Vt., Fort Devens, Mass.
HORTON, William H., 1st Lieut., Fall River, Mass., Hartford, Conn.
JOSEPHS, William W., 1st Lieut., New Haven, Conn., Fort Devens, Mass.
KANSKI, Francis A., 1st Lieut., Springfield, Mass., Camp Edwards, Mass.
KEMBLE, Robert P., Captain, Worcester, Mass., Camp Edwards, Mass.
KNOX, Barron D., Lieut., M. R. C., Holyoke, Mass., Camp Forrest, Tenn.
KOUFMAN, William B., 1st Lieut., New Haven, Conn., Hartford, Conn.
LEVIN, Julius R., 1st Lieut., Burlington, Vt., Camp Edwards, Mass.
LEVINSON, Samuel S., 1st Lieut., Malden, Mass., Camp Shelby, Miss.
LEWIS, Henry R., Lieut., M. R. C., Wethersfield, Conn., Camp Forrest, Tenn.
LEWIS, Samuel D., 1st Lieut., Hartford, Conn., Camp Claiborne, La.
LISBON, Wallace, 1st Lieut., Providence, R. I., Camp Edwards, Mass.
McVETTY, Rufus H., 1st Lieut., North Stratford, N. H., Maxwell Field, Ala.
MALONEY, John D., 1st Lieut., Waverley, Mass., Camp Edwards, Mass.
MARDER, Samuel H., 1st Lieut., Westboro, Mass., Maxwell Field, Ala.
MILLER, Himon, 1st Lieut., Providence, R. I., Providence, R. I.
MOORE, Kenneth T., 1st Lieut., Providence, R. I., Fort Bragg, N. C.
NATHAN, Edward M., 1st Lieut., Quincy, Mass., Maxwell Field, Ala.
NORTON, Thomas J., Captain, Pittsfield, Mass., Hartford, Conn.
OTIS, Carlos G., 1st Lieut., Townsend, Vt., Camp Claiborne, La.
PALMER, Edwin J., Captain, M. R. C., Palmer, Mass., Camp Forrest, Tenn.
POWERS, Michael F., Lieut., M. R. C., Bellows Falls, Vt., Fort Oglethorpe, Ga.
RICCIO, Joseph S., 1st Lieut., Hamden, Conn. Maxwell Field, Ala.
SANDS, Sidney L., Lieut., M. R. C., Worcester, Mass., Camp Forrest, Tenn.
SEGAL, Leo, Lieut., M. R. C., North Troy, Vt., Fort Oglethorpe, Ga.
SHANNON, Edward T., 1st Lieut., Fall River, Mass., Camp Edwards, Mass.
SHERWIN, Herbert, Captain, Cambridge, Mass., Maxwell Field, Ala.
SMITH, Gordon B., Lieut., M. R. C., Rutland, Vt., Camp Forrest, Tenn.
SPIEGEL, Charles M., Lieut., M. R. C., New Haven, Conn., Camp Forrest, Tenn.
SWEET, Gustaf, 1st Lieut., Providence, R. I., Camp Edwards, Mass.
THORNE, Lewis, Lieut., M. R. C., New Haven, Conn., Fort Rodman, Mass.
VERNON, Sidney, Lieut., M. R. C., Willimantic, Conn., Camp Forrest, Tenn.
WEISMAN, Jacob I., 1st Lieut., Springfield, Mass., Camp Edwards, Mass.
WEISS, Louis R., 1st Lieut., Brookline, Mass., Fort Oglethorpe, Ga.
YOUNG, Leo A., 1st Lieut., Fitchburg, Mass., Camp Wheeler, Ga.

Orders Revoked

ABODEELY, Robert A., 1st Lieut., Worcester, Mass.
BELLIOTTI, Joseph L., Lieut.-Col., Providence, R. I.
FAY, Thomas F., 1st Lieut., Augusta, Me.
FIELD, Eugene A., 1st Lieut., Providence, R. I.
HASCALL, Theodore C., Major, Riverside, R. I.
MAINVILLE, Albert L., Captain, Leominster, Mass.
MATTERA, Vincent J., 1st Lieut., Providence, R. I.

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ALFORD, Kenneth M., 1st Lieut., Buffalo, Fort Niagara, N. Y.
AURINGER, Horace E., Major, Addison, N. Y., Fort Ontario, N. Y.
BLEICH, Lamoyne C., 1st Lieut., Buffalo, Fort Bragg, N. C.
BLOCK, Richard M., 1st Lieut., Kenmore, N. Y., Fort Bragg, N. C.
BRIGGS, Bernard D., 1st Lieut., McGraw, N. Y., Fort Bragg, N. C.
CARPENTER, Walter, 1st Lieut., New York, Fort Jay, N. Y.
CHASSY, Gilbert H., 1st Lieut., Bronx, N. Y., Fort Jackson, S. C.
CILIBERTI, Benjamin Joseph, 1st Lieut., Yonkers, N. Y., Fort DuPont, Del.
CITRON, Adolph E., 1st Lieut., Baldwin, L. I., N. Y., Fort DuPont, Del.
COLEMAN, Joseph A., 1st Lieut., New York, Fort Hancock, N. J.
COLMER, Malcolm L., 1st Lieut., New York, Fort Dix, N. J.
COPPOLA, Andrew R., 1st Lieut., Brooklyn, Fort Benning, Ga.
CORBETT, Austin J., 1st Lieut., New York, Fort Benning, Ga.
CORCORAN, William R., 1st Lieut., Binghamton, N. Y., Fort Jay, N. Y.
COWEN, Louis, 1st Lieut., Brooklyn, Fort Hamilton, N. Y.
CULVER, Wesley Y., 1st Lieut., Long Island, N. Y., Fort DuPont, Del.
D'AVERSA, Generoso, 1st Lieut., Brooklyn, Fort Jackson, S. C.
DiFABIO, Anthony J., 1st Lieut., Bronx, N. Y., Mitchel Field, N. Y.
DOBKIN, Milton C., 1st Lieut., Ventnor, N. J., Fort Bragg, N. C.
DOLCE, Joseph R., Captain, Buffalo, Fort Niagara, N. Y.
D'ONOFRIO, Gregory, Captain, Brooklyn, Plattsburg Barracks, N. Y.
DURANTE, Michael H., 1st Lieut., Rochester, N. Y., Fort Ontario, N. Y.
FINCH, Charles S., Jr., 1st Lieut., Jamaica, L. I., N. Y., Camp Livingston, La.
FLAHERTY, Morton H., 1st Lieut., White Plains, N. Y., Fort Hancock, N. J.
FRIEDMAN, Eliot M., 1st Lieut., Utica, N. Y., Fort Ontario, N. Y.
GANNON, John R., 1st Lieut., Pelham, N. Y., Fort Hancock, N. J.
GAYDOS, Albert L., 1st Lieut., Brooklyn, Fort Wadsworth, N. Y.
GLASSMAN, Herman, 1st Lieut., Brooklyn, Fort Bragg, N. C.
GLICK, Bernard, Captain, Brooklyn, Camp Claiborne, La.
GREELEY, Horace, Jr., 1st Lieut., Brooklyn, Fort Dix, N. J.
GRENLEY, Philip, 1st Lieut., Brooklyn, Fort Niagara, N. Y.
GRILIHAS, Morris, 1st Lieut., Brooklyn, Camp Blanding, Fla.
GROSS, Joseph M., 1st Lieut., Brooklyn, Fort Bragg, N. C.
GUTKIN, Morton L., 1st Lieut., Brooklyn, Fort Niagara, N. Y.
HALPERIN, Barnet, 1st Lieut., Brooklyn, Fort Bragg, N. C.
HARRIS, William L., 1st Lieut., Kings Park, L. I., N. Y., Fort Benning, Ga.
HARTMANN, Alfred A., 1st Lieut., Malone, N. Y., Plattsburg Barracks, N. Y.
HARTMANN, Edmund M., 1st Lieut., Jamaica, L. I., N. Y., Fort Benning, Ga.
HARWOOD, Mark R., 1st Lieut., Dexter, N. Y., Madison Barracks, N. Y.
HUBBARD, Oscar E., 1st Lieut., Buffalo, Fort Bragg, N. C.
JAGODA, Leonard S., 1st Lieut., New York, Fort Jackson, S. C.
JOSEPHSON, Frederick, 1st Lieut., Flushing, L. I., N. Y., Fort Hamilton, N. Y.
KAPLAN, Eugene S., 1st Lieut., Brooklyn, Camp Livingston, La.
KAPLAN, Jack A., 1st Lieut., Jersey City, N. J., Fort Bragg, N. C.
KAPLAN, Samuel D., 1st Lieut., Hillside, N. J., Fort Bragg, N. C.

KAUFMAN, Robert E., 1st Lieut., New York, Fort Benning, Ga.
KELLEHER, Dennis A., 1st Lieut., Brooklyn, Fort Monmouth, N. J.
KINDER, Frederick, 1st Lieut., New York, Camp Forest, Tenn.
KLEINFELD, Morris, 1st Lieut., Brooklyn, Pine Camp, N. Y.
KRON, William L., 1st Lieut., Brooklyn, Induction Station, Buffalo.
LANG, Sydney L., 1st Lieut., Staten Island, N. Y., Fort Monmouth, N. J.
LARKIN, Edward A., 1st Lieut., Amenia, N. Y., Fort DuPont, Del.
LEIBOWITZ, Harry, Captain, Brooklyn, N. Y., Camp Livingston, La.
LEVENSTEIN, Louis S., 1st Lieut., Bronx, N. Y., Camp Livingston, La.
LEWIS, Fredric, 1st Lieut., New York, Plattsburg Barracks, N. Y.
LIEBERMAN, Leo A., Captain, New York, Fort Bragg, N. C.
LOCASCIO, Nicholas R., Captain, Bronx, N. Y., Fort Hancock, N. J.
LORENZO, James V., 1st Lieut., Brooklyn, Camp Claiborne, La.
McCARTHY, John J., 1st Lieut., Elmhurst, L. I., N. Y., Pine Camp, N. Y.
McKNIGHT, William K., Captain, White Plains, N. Y., Camp Upton, N. Y.
MAILLARD, Leslie W., 1st Lieut., Flushing, L. I., N. Y., Fort Wadsworth, N. Y.
MALINS, Maurice L., 1st Lieut., New York, Madison Barracks, N. Y.
MASCALI, Angelo, 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.
MASTELLONE, Aniello F., 1st Lieut., New York, Fort Bragg, N. C.
MELLOW, Joseph A., 1st Lieut., New York, Fort Dix, N. J.
MESSINGER, Emanuel, 1st Lieut., Jamaica, L. I., N. Y., Induction Station, Fort Jay, N. Y.
MILLS, Clifford W., 1st Lieut., New York, Camp Croft, S. C.
MORRONE, Francis X., 1st Lieut., Yonkers, N. Y., Fort Bragg, N. C.
MULHOLLAND, Herbert, 1st Lieut., Far Rockaway, N. Y., Pine Camp, N. Y.
MULLAN, Hugh, 1st Lieut., Stapleton, S. I., N. Y., Fort Benning, Ga.
NEICHIN, Sudney N., 1st Lieut., Brooklyn, Fort Monmouth, N. J.
NUESKE, Frederick W., 1st Lieut., Freeport, L. I., N. Y., Fort Bragg, N. C.
OESTREICH, Mitchell, 1st Lieut., Brooklyn, Fort Hancock, N. J.
PARKE, Charles L., 1st Lieut., Yonkers, N. Y., Fort Bragg, N. C.
PLOTKIN, Jacob B., Major, Brooklyn, Fort Dix, N. J.
PORT, Murray, 1st Lieut., New York, Camp Livingston, La.
PRESTON, William O., Captain, New York, Camp Blanding, Fla.
PRINCE, Arthur, Captain, Tuckahoe, N. Y., Fort DuPont, Del.
PSAKI, Constantine G., Captain, Forrest Hills, N. Y., Induction Station, Buffalo.
RAPPA, James F., 1st Lieut., Brooklyn, Fort Benning, Ga.
REISER, Paul, 1st Lieut., New York, Fort Bragg, N. C.
ROBINSON, Arthur, 1st Lieut., New York, Fort Bragg, N. C.
ROCK, Roger J., 1st Lieut., Brooklyn, Fort Bragg, N. C.
ROTHMAN, Albert, 1st Lieut., Syracuse, N. Y., Fort Niagara, N. Y.
RUBENFELD, Sidney, 1st Lieut., New York, Fort Hancock, N. J.
RUBIN, Abraham, 1st Lieut., Brooklyn, Fort Jackson, S. C.
SAFRAN, Nathaniel, 1st Lieut., Flushing, L. I., N. Y., Fort Slocum, N. Y.
SANTORO, George R., 1st Lieut., West Brighton, S. I., N. Y., Fort Hamilton, N. Y.
SAX, Charles E., 1st Lieut., Paterson, N. J., Camp Blanding, Fla.
SCHACHNO, Joseph, 1st Lieut., Brooklyn, Camp Claiborne, La.
SCHILDKRAUT, Milton, 1st Lieut., Bronx, N. Y., Camp Croft, S. C.
SCHOFIELD, Oscar, 1st Lieut., Brooklyn, Camp Claiborne, La.
SCHWARTZ, Marcus, Captain, White Plains, N. Y., Induction Station, Fort Jay, N. Y.
SCHWARTZ, Serge D., 1st Lieut., New York, Fort Bragg, N. C.
SHAW, Edward, 1st Lieut., New York, Plattsburg Barracks, N. Y.
SIEGEL, Edward, 1st Lieut., Poughkeepsie, N. Y., Plattsburg Barracks, N. Y.
SOLOMON, Marvin N., 1st Lieut., Bronx, N. Y., Fort Jackson, S. C.
SOLOVAY, Hyman, 1st Lieut., Brooklyn, Camp Blanding, Fla.
STACK, Harry G., Captain, Brooklyn, Induction Station, Fort Jay, N. Y.
STANTON, Edwin Y., 1st Lieut., Flushing, L. I., N. Y., Fort Hamilton, N. Y.
STARK, Charles W., 1st Lieut., Flushing, L. I., N. Y., Camp Upton, N. Y.
STECKLER, Julius, 1st Lieut., New York, Camp Claiborne, La.
STELMAN, Henry H., Captain, Buffalo, Fort Niagara, N. Y.
STIVALA, George J., 1st Lieut., New York, Camp Blanding, Fla.
STOLL, Bernard, 1st Lieut., Brooklyn, Camp Croft, S. C.
STROTZ, Charles M., Lieut. Col., Lyons, N. J., Plattsburg Barracks, N. Y.
SUSKIN, Samuel, 1st Lieut., Bronx, N. Y., Plattsburg Barracks, N. Y.
TADDEO, Mario C., 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.
TAUSIG, Daniel P., 1st Lieut., New York, Fort Benning, Ga.
THORNE, Irving J., 1st Lieut., New York, Fort Benning, Ga.
TOPPERMAN, Samuel, 1st Lieut., Orisville, N. Y., Camp Stewart, Ga.
TURNER, Oscar A., 1st Lieut., Brooklyn, Fort Bragg, N. C.
VACCA, Joseph G., 1st Lieut., Kingston, N. Y., Fort Jackson, S. C.
VALENTI, Frank D., 1st Lieut., New York, Camp Claiborne, La.
VIOLA, Lawrence E., 1st Lieut., Great Kills, S. I., N. Y., Camp Stewart, Ga.
WASSERMAN, Seymour H., 1st Lieut., Brooklyn, Fort Moultrie, S. C.
WELLER, Milton J., 1st Lieut., Brooklyn, Plattsburg Barracks, N. Y.
WILLINGER, Hyman, Captain, Bronx, N. Y., Fort Dix, N. J.
WOLTMANN, Charles E., 1st Lieut., Hoboken, N. J., Induction Station, Buffalo.
ZIPPEN, George J., 1st Lieut., New York, Fort Barrancas, Fla.

CORRECTION

Captain Zukauckas.—In the list of reserve officers ordered to active duty under the Second Corps Area in THE JOURNAL May 3, page 2061, Edward W. Zukauckas of Brooklyn was listed as a first lieutenant serving at Fort Dix, N. J., when he should have been listed as a captain.

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

CARDWELL, Edward S., Jr., 1st Lieut., Memphis, Tenn., Fort Jackson, S. C.
CARITHERS, Hugh A., Jr., 1st Lieut., Winder, Ga., Fort Bragg, N. C.
CHAPMAN, Charles Granger, 1st Lieut., Columbia, S. C., Camp Livingston, La.
CORRELL, William C., 1st Lieut., Memphis, Tenn., Camp Polk, La.
FERBER, Leon, 1st Lieut., Nashville, Tenn., Camp Claiborne, La.
FRANCIS, John Joseph, 1st Lieut., New Orleans, Camp Claiborne, La.
GOWER, Orien Thomas, Jr., 1st Lieut., Cordele, Ga., Camp Grant, Ill.
HENRY, Jennings L., 1st Lieut., Atlanta, Ga., Camp Davis, N. C.
HENRY, John Arnold, 1st Lieut., Atlanta, Ga., Camp Blanding, Fla.
JORDAN, William K., 1st Lieut., Milledgeville, Ga., Camp Davis, N. C.
KRON, John Louis, Jr., 1st Lieut., New Orleans, Camp Davis, N. C.
LAW, Edward H., Jr., 1st Lieut., Columbia, S. C., Camp Claiborne, La.
McCULLOUGH, George C., 1st Lieut., Birmingham, Ala., Camp Shelby, Miss.
NEIGHBORS, Joseph B., Jr., 1st Lieut., Macon, Ga., Camp Blanding, Fla.
OVERSTREET, Ralph M., Jr., 1st Lieut., Miami, Fla., Camp Stewart, Ga.
PUGH, William W., Jr., 1st Lieut., Napoleonville, La., Camp Polk, La.
ROUGELOT, Robert Emile, 1st Lieut., New Orleans, Fort Oglethorpe, Ga.
SALTZ, Nathan Jacob, 1st Lieut., Jacksonville, Fla., Camp Claiborne, La.
SCHUDMAK, Melvin A., 1st Lieut., White Castle, La., Camp Beauregard, La.
SEWELL, Bennette N., 1st Lieut., Boyce, La., Camp Livingston, La.
SHAW, James Graham, 1st Lieut., Columbia, S. C., Camp Davis, N. C.
STABLER, Ernest V., 1st Lieut., Greenville, Ala., Fort Oglethorpe, Ga.
SULLIVAN, Benjamin H., 1st Lieut., Tampa, Fla., Camp Livingston, La.
THOMAS, George Eugene, 1st Lieut., New Orleans, Camp Grant, Ill.
UNDERWOOD, Edgar H., Jr., 1st Lieut., Fairfield, Ala., Camp Wallace, Texas.
WHITWORTH, Horace M., Jr., 1st Lieut., Greenville, S. C., Camp Blanding, Fla.
WILKES, John Burwell, 1st Lieut., Durant, Miss., Camp Claiborne, La.
WILKINS, Samuel A., Jr., 1st Lieut., Dallas, N. C., Fort Bragg, N. C.

Orders Revoked

ASSEY, Philip E., 1st Lieut., Georgetown, S. C.
GREEN, Albert H., Major, Birmingham, Ala.
MATHIAS, Marion L., 1st Lieut., Charleston, S. C.
MORROGH, Lailor A., Jr., 1st Lieut., Breaux Bridge, La.
NOLAN, Lewis E., Captain, St. Petersburg, Fla.
NOTO, Joseph J., 1st Lieut., Baton Rouge, La.
SCOTT, William S., 1st Lieut., Spartanburg, S. C.
STANFIELD, William W., 1st Lieut., Dunn, N. C.
WAGNER, Rudolph T., 1st Lieut., Miami Beach, Fla.

Relieved from Duty

BRACKSTONE, LeRoy B., 1st Lieut., Iuka, Miss.
CARDWELL, Edward S., Jr., 1st Lieut., Memphis, Tenn.
DAVIS, Charles W., Jr., 1st Lieut., Humboldt, Tenn.
MARTIN, Marion T., 1st Lieut., Memphis, Tenn.

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

AGIN, Lambert J., 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.
ALEXANDER, Martin M., 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.
BARKETT, Soddie J., 1st Lieut., Cairo, Ill., Scott Field, Ill.
BINDER, Paul, 1st Lieut., Chicago, Scott Field, Ill.
BIRNDORF, Leonard, 1st Lieut., Detroit, 27th Division, Fort McClellan, Ala.
BOHORFOUSH, Joseph G., 1st Lieut., Madison, Wis., Air Corps Basic Flying School, San Angelo, Texas.
BOICE, William A., Captain, Chicago, 5th Division, Fort Custer, Mich.
BOOTHBY, Carl F., 1st Lieut., Lawrence, Mich., Selfridge Field, Mount Clemens, Mich.
CAPLAN, Leslie, 1st Lieut., Detroit, Randolph Field, Texas.
CHIPMAN, Elwood M., 1st Lieut., Quincy, Mich., Medical Battalion, 5th Division, Fort Custer, Mich.
CONGER, Kyril B., 1st Lieut., Ann Arbor, Mich., Air Base, Tucson, Ariz.
COOPER, George J., 1st Lieut., Chicago, 11th Station Hospital, Fort Custer, Mich.
COVELL, Kermit W., 1st Lieut., Racine, Wis., Air Base, Albuquerque, N. M.

DILLAHUNT, Jack A., 1st Lieut., Detroit, 27th Division, Fort McClellan, Ala.
DVORAK, Harold J., Captain, Milwaukee, 5th Division, Fort Custer, Mich.
ERBES, John, 1st Lieut., Milwaukee, Armored Force Troop Unit, Fort Benning, Ga.
FAULCONER, Albert, 1st Lieut., Rochester, Mich., Station Hospital, Fort Custer, Mich.
GEARHART, Robert S., 1st Lieut., Madison, Wis., Station Hospital, Fort Sill, Okla.
GIARDINA, Jacob J., 1st Lieut., Chicago, Air Base, Tucson, Ariz.
GREENBERG, Harold A., Captain, Chicago, 5th Division, Fort Custer, Mich.
GREENWOOD, Robert C., 1st Lieut., Chicago, Randolph Field, Texas.
HAMILTON, Earl E., 1st Lieut., Traverse City, Mich., Selfridge Field, Mount Clemens, Mich.
HARLEY, Garth H., 1st Lieut., Detroit, Station Hospital, Fort Sill, Okla.
HARRISON, Rollie M., 1st Lieut., Chicago, Scott Field, Ill.
JOACHIM, Frederick G., 1st Lieut., Madison, Wis., Chanute Field, Rantoul, Ill.
KAPLAN, Benjamin, 1st Lieut., Chicago, Air Base, Tucson, Ariz.
KIRGIS, Harold J., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.
KRAUSE, Charles D., 1st Lieut., Chicago, Air Base, Oklahoma City.
LANE, Milton, 1st Lieut., Bay City, Mich., 27th Division, Fort McClellan, Ala.
LANSKY, Mandell, 1st Lieut., Detroit, 27th Division, Fort McClellan, Ala.
LEWIS, Raymond O., 1st Lieut., West Detroit, Mich., Chanute Field, Rantoul, Ill.
McCLAY, Elmo Todd, 1st Lieut., Springfield, Ill., Chanute Field, Rantoul, Ill.
MATZNER, Irving A., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.
MEETER, Urquhart L., 1st Lieut., Oshkosh, Wis., Chanute Field, Rantoul, Ill.
MITCHELL, George T., 1st Lieut., Marshall, Ill., Air Base, Albuquerque, N. M.
NADHERNY, George C., 1st Lieut., Cicero, Ill., Chanute Field, Rantoul, Ill.
NIVER, Edwin O., 1st Lieut., Eau Claire, Wis., Station Hospital, Fort Custer, Mich.
PELKEY, George L., 1st Lieut., Chicago, U. S. Army Induction Station, Chicago.
PETERSON, Stanley C., 1st Lieut., Luck, Wis., Randolph Field, Texas.
PINNE, George F., Jr., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.
REHNER, Robert C., 1st Lieut., Ann Arbor, Mich., 27th Division, Fort McClellan, Ala.
RICHARDS, Ned W., 1st Lieut., Saginaw, Mich., Station Complement, Camp Davis, N. C.
SCHREIBER, Manuel, 1st Lieut., Chicago, Scott Field, Ill.
SCHWARTZ, Louis B., 1st Lieut., Manteno, Ill., Randolph Field, Texas.
SOSSON, Edward, 1st Lieut., Chicago, Air Base, Oklahoma City.
STEIN, Edward, 1st Lieut., Detroit, Air Base, Albuquerque, N. M.
SZABO, Stephen A., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.
THOMSON, Daniel C., 1st Lieut., Ann Arbor, Mich., Air Base, Oklahoma City.
UNCAPHER, Rex P., 1st Lieut., Evanston, Ill., U. S. Army Induction Station, Peoria, Ill.
WEINSHEL, Leo R., 1st Lieut., Milwaukee, Scott Field, Ill.
WEINSTEIN, Roy C., 1st Lieut., Chicago, Air Base, Tucson, Ariz.
WERNER, Jerome J., 1st Lieut., Milwaukee, U. S. Army Induction Station, Milwaukee.

SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

ADLER, Morton W., 1st Lieut., St. Louis, Mo., Fort Snelling, Minn.
BLACKER, Morris Roland, 1st Lieut., Wichita, Kan., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.
BRILLHART, Everett G., 1st Lieut., Shelby, Neb., Camp Joseph T. Robinson, Ark.
CATEY, Robert Massey, 1st Lieut., Milbridge, S. D., Corps Area Service Command Reception Center Infirmary, Jefferson Barracks, Mo.
CIMFEL, Adolph Bohumil, 1st Lieut., M. R. C., Scotia, Neb., Corps Area Service Command Replacement Center Infirmary, Fort Leonard Wood, Mo.
CLARK, Richardson Evans, 1st Lieut., Manchester, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
CRAWFORD, William H., Major, Omaha, Fort Ord, Calif.
DYSTERHEFT, Adolf, Captain, Gaylord, Minn., Cavalry Replacement Center Infirmary, Fort Riley, Kan.
EDINGTON, Frank Dennis, Major, Spencer Iowa, Corps Area Service Command Station Hospital, Jefferson Barracks, Mo.
EGLEY, Loren Edward, 1st Lieut., Maryville, Mo., 85th Field Artillery, Camp Roberts, Calif.
ELIAS, Houghton Francis, Captain, Beatrice, Neb., Corps Area Service Command Station Hospital, Fort Crook, Neb.
EMOND, Joseph Samuel, Captain, Farmington, Minn., 135th Station Hospital, Camp Roberts, Calif.
GILFILLAN, Clarence David Neuton, 1st Lieut., M. R. C., Eldon, Iowa, Corps Area Service Command Engineer Replacement Training Center Infirmary, Fort Leonard Wood, Mo.
GREENE, Arthur Morton, 1st Lieut., Omaha, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.
HANKS, Ralf, 1st Lieut., Fulton, Mo., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.
HAUGE, Erling Trygve, 1st Lieut., Minneapolis, 1st Cavalry Division, Fort Bliss, Texas.
HAVEL, Harold William, 1st Lieut., M. R. C., Jordan, Minn., Field Artillery, 2d Cavalry Division, Fort Riley, Kan.
HEIEMANN, Sol, 1st Lieut., Newport, Ark., 178th Field Artillery, Fort Bragg, N. C.
HOLLAND, Cleon Richard, 1st Lieut., Minneapolis, Corps Area Service Command Cavalry Replacement Center Infirmary, Fort Riley, Kan.
KELSEY, Kenneth Lawrence, 1st Lieut., M. R. C., Aurora, Mo., Corps Area Service Command Station Hospital, Fort Meade, S. D.
KIRKLAND, Samuel Sylvester, 1st Lieut., Marshall, Ark., 42d Evacuation Hospital, Fort Leonard Wood, Mo.
KLEINE, Hans Louis, Major, St. Louis, Medical Detachment, 63d Infantry, Fort Leonard Wood, Mo.
KYGER, Edgar Ross, Jr., 1st Lieut., M. R. C., Kansas City, Mo., Field Artillery, 2d Cavalry Division, Fort Riley, Kan.
LOTMAN, Harry A., 1st Lieut., Lincoln, Neb., Camp Shelby, Miss.
MAGNESS, Guy Norton, Captain, M. R. C., University City, Mo., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.
MARTIN, Melvin C., Captain, Newton, Kan., Fort Custer, Mich.
MERZ, Jean Joseph, 1st Lieut., M. R. C., St. Louis, Field Artillery, 2d Cavalry Division, Fort Riley, Kan.
MOONEY, Robert Davis, 1st Lieut., St. Paul, Corps Area Service Station Hospital, Fort Leonard Wood, Mo.
MOORE, Robert Hollingsworth, 1st Lieut., Lansing, Kan., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.
NEVITT, James Russell, Captain, M. R. C., Moran, Kan., Field Artillery, 2d Cavalry Division, Fort Riley, Kan.
PRACHAR, Gordon Allen, 1st Lieut., Madison, Neb., 53d Evacuation Hospital, Camp San Luis Obispo, Calif.
PRUSMACK, John Jacob, Clarinda, Iowa, Corps Area Service Command Induction Station, Jefferson Barracks, Mo.
RAINES, Oney Carstaffen, Jr., 1st Lieut., St. Louis, 114th General Hospital, Camp J. T. Robinson, Ark.
READER, Donald Richard, 1st Lieut., Fergus Falls, Minn., Corps Area Service Command Induction Station, Fort Snelling, Minn.
ROGERS, Charles Wesley, 1st Lieut., M. R. C., Heron Lake, Minn., Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.
RYAN, Michael Joseph, 1st Lieut., Kansas City, Kan., Corps Area Service Command Induction Station, Fort Des Moines, Iowa.
SEAMEN, Charles LeRoy, 1st Lieut., Mount Ayr, Iowa, 4th Cavalry, Fort Meade, S. D.
SWIFT, Charles Henry Jr., 1st Lieut., Marcus, Iowa, 1st Cavalry Division, Fort Bliss, Texas.
TURNER, Wylie Erasmus, 1st Lieut., M. R. C., Piggott, Ark., Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.
WOOD, Bennett Raymond, 1st Lieut., St. Louis, Corps Area Service Command Induction Station, Jefferson Barracks, Mo.
UTLEY, Francis Edward, Jr., 1st Lieut., Blytheville, Ark., 4th Cavalry, Fort Meade, S. D.

Orders Revoked

CORN, Henry H., 1st Lieut., Des Moines, Iowa.
GREENBERG, Maynard Maurice, Captain, Omaha, Fort Leonard Wood, Mo.
KNOLL, William, 1st Lieut., Hot Springs, S. D.
McKINSTRY, Karl Virgil, 1st Lieut., De Soto, Mo., 3d Cavalry Brigade, Fort Riley, Kan.
SATTERFIELD, Benjamin W., 1st Lieut., St. Louis, 4th Cavalry Brigade, Fort Riley, Kan.

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

ALLEN, Lloyd R., Lieut. Col., Colorado Springs, Colo., Selective Service System, Santa Fe, N. M.
ARMBRUST, Charles A., Jr., 1st Lieut., Dallas, Texas, 2d Division, Fort Sam Houston, Texas.
BANGEMAN, John O., 1st Lieut., LaJunta, Colo., Station Hospital, Fort Bliss, Texas.
BENSON, John C., Jr., 1st Lieut., El Paso, Texas, Station Hospital, Fort Bliss, Texas.
BLOCK, Herbert Edward, 1st Lieut., Fort Sam Houston, Texas, 2d Division, Fort Sam Houston, Texas.
BOEHM, William, 1st Lieut., Denver, 2d Division, Fort Sam Houston, Texas.
BRASELTON, Charles W., Jr., 1st Lieut., Fort Worth, Texas, 82d Field Artillery, Fort Bliss, Texas.
BURDITT, Buckly Lee, 1st Lieut., Dallas, Texas, 2d Division, Fort Sam Houston, Texas.
BUSH, Jordan Morgan, 1st Lieut., Oklahoma City, Station Hospital, Fort Sill, Okla.
CAVANAUGH, John W., 1st Lieut., Oklahoma City, 200th Coast Artillery (AA), Fort Bliss, Texas.
CONNALLY, Herschel F., Jr., 1st Lieut., Waco, Texas, Station Hospital, Fort Sill, Okla.
CROXDALE, Edward Lee, 1st Lieut., Denver, 25th Infantry, Fort Huachuca, Ariz.

DANIELS, Bernard T., 1st Lieut., Denver, Corps Area Service Command, Camp Normoyle, Texas.
FARNAM, Lorenzo Matthew, Jr., 1st Lieut., Oklahoma City, 36th Division, Camp Bowie, Texas.
FAYLE, Percy Riley, 1st Lieut., Houston, Texas, Station Hospital, Fort Sam Houston, Texas.
GANDY, William M., 1st Lieut., Houston, Texas, 202d Coast Artillery (AA), Fort Bliss, Texas.
GIBSON, Hester M., Jr., 1st Lieut., Lubbock, Texas, 112th Cavalry, Fort Clark, Texas.
HAYNES, Henry M., Jr., 1st Lieut., Gatesville, Texas., Station Hospital, Fort Sam Houston, Texas.
HODGES, Tom Wiley, 1st Lieut., Boston, Station Hospital, Fort Bliss, Texas.
HOUSE, Royce Eugene, 1st Lieut., Dallas, Texas, 2d Division, Fort Sam Houston, Texas.
ISBERG, Emil Mark, 1st Lieut., Denver, 25th Infantry, Fort Huachuca, Ariz.
ISEN, Paul Jonathan, 1st Lieut., Waco, Texas, 52d Signal Battalion, Fort Sam Houston, Texas.
JONES, Leonard B., 1st Lieut., Taft, Texas, Station Hospital, Fort Sill, Okla.
KAHN, Robert W., 1st Lieut., St. Louis, 45th Division, Camp Barkeley, Texas.
KEARNS, Harry Joseph, 1st Lieut., Cripple Creek, Colo., 77th Field Artillery, Fort D. A. Russell, Texas.
KENDIG, Thomas A., 1st Lieut., Safford, Ariz., Station Hospital, Fort Sam Houston, Texas.
KERR, Walter C. H., 1st Lieut., Picher, Okla., 113th Cavalry, Camp Bowie, Texas.
KLOTZ, William F., Captain, McAlester, Okla., Station Hospital, Fort Sam Houston, Texas.
KOFF, Salmon Arthur, Major, Fort Bayard, N. M., Station Hospital, Fort Bliss, Texas.
LEWIN, Julian R., 1st Lieut., Redvale, Colo., Camp Grant, Ill.
LEY, Eugene B., 1st Lieut., Oklahoma City, Station Hospital, Camp Wolters, Texas.
LYDAY, Victor Ivan, 1st Lieut., Dallas, Texas., Corps Area Laboratory, Fort Sam Houston, Texas.
MAHONE, Marion Wilson, 1st Lieut., Houston, Texas, 202d Coast Artillery (AA), Fort Bliss, Texas.
MARKOWITZ, Allan E., 1st Lieut., Abilene, Texas, 36th Division, Camp Bowie, Texas.
MARTINAK, Richard E., 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.
MAXFIELD, George S., 1st Lieut., Waco, Texas, Station Hospital, Fort Bliss, Texas.
MAYO, Oscar N., Major, Brownwood, Texas, Station Hospital, Camp Wallace, Texas.
MERVYNNE, Robert Duncan, 1st Lieut., Phoenix, Ariz., 25th Infantry, Fort Huachuca, Ariz.
MILLER, Walter S., Jr., 1st Lieut., Laredo, Tex., Camp Grant, Ill.
MILLS, Edward K., 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.
MOFFATT, Thomas William, 1st Lieut., Denver, 2d Division, Fort Sam Houston, Texas.
MOFFITT, Laurl W., 1st Lieut., Tucson, Ariz., Station Hospital, Fort Sam Houston, Texas.
MURRY, Abel V., 1st Lieut., Picher Okla., 260th Corps Area, Fort Bliss, Texas.
PHELAN, Ralph Stewart, 1st Lieut., Houston, Texas., 36th Division, Camp Bowie, Texas.
ROBERTS, Joe Henry, 1st Lieut., Houston, Texas, 36th Division, Camp Bowie, Texas.
ROBINSON, Webber T., 1st Lieut., Philadelphia, 36th Division, Camp Bowie, Texas.
SCHUBERT, Herbert A., 1st Lieut., Washington, D. C., 45th Division, Camp Barkeley, Texas.
SHAFER, Troy A., 1st Lieut., Harlingen, Texas, 36th Division, Camp Bowie, Texas.
SHANNON, Manning, 1st Lieut., Cleveland, Station Hospital, Fort Sam Houston, Texas.
SHAW, Guy G., Jr., 1st Lieut., Shreveport, La., 2d Division, Fort Sam Houston, Texas.
SHELTON, E. L., Jr., 1st Lieut., Richmond, Va., 45th Division, Camp Barkeley, Texas.
SHERE, Norbert L., 1st Lieut., Denver, 36th Division, Camp Bowie, Texas.
SPARK, Milton, 1st Lieut., Waco, Texas, 202d Coast Artillery (AA), Fort Bliss, Texas.
TWINEHAM, Walter C., 1st Lieut., El Paso, Texas, Station Hospital, Fort Bliss, Texas.
WHEELER, Homer C., 1st Lieut., St. Louis, Station Hospital, Fort Sill, Okla.

Orders Revoked

ANTHONY, William Dodd, 1st Lieut., Gallup, N. M.
CAIRNS, Arthur Buell, 1st Lieut., Dallas, Texas.
CALONGE, Guy E., 1st Lieut., LaJunta, Colo.
CLARK, Ralph O., 1st Lieut., Oklahoma City.
COGBURN, Charles Cnewton, 1st Lieut., Nixon, Texas.
DOWNING, Gerald G., 1st Lieut., Lawton, Okla.
FRANK, Charles H., Captain, Texarkana, Texas.
GRUMBLES, Ernest W., 1st Lieut., Atlanta, Texas.
HARTGRAVES, Thos. A., Major, Phoenix, Ariz.
HOOKER, Lyle, 1st Lieut., Houston, Texas.
HYDE, William A., 1st Lieut., Durant, Okla.
IVY, J. B., 1st Lieut., Weslaco, Texas.
LAPAN, Charles H., 1st Lieut., Lamar, Colo.
LENOX, Walter Riley, 1st Lieut., Fort Worth, Texas.
McKINSEY, S. Joe, Captain, McAllen, Texas.
NEWSOM, Robert Lee, 1st Lieut., Munday, Texas.
PRYOR, V. W., 1st Lieut., Holdenville, Okla.
SCHULSE, Roscoe, 1st Lieut., Schulenburg, Texas.
WILLIAMS, Harold Murphy, 1st Lieut., Fort Worth, Texas.
WOOLF, Jack I., 1st Lieut., Dallas, Texas.
WYATT, Malcolm H., 1st Lieut., Amarillo, Texas.

BED CAPACITY OF ARMY HOSPITALS

The U. S. Army will have nine new general hospitals by the end of 1941, according to a report prepared by the Construction Division of the Office of the Quartermaster General. In addition, there are one hundred and thirty-three post hospitals on various military reservations throughout the country.

Of the total of thirteen general hospitals, which will have thirteen thousand, seven hundred and fifty-eight beds, four are established, six were recently completed and three are under construction.

The post hospitals have a total of sixty-five thousand five hundred beds and they are equipped to handle any kind of medical or surgical case. The post hospitals are established, however, with the view of handling short-time patients. The general hospitals receive patients requiring long confinement, patients suffering from chronic ailments and, where it is possible to move ever, with the view of handling short-time patients. The general hospitals are located in important cities or army posts which are easily accessible to troops stationed in their particular part of the country.

In addition to maintaining the highest standards of medical science, the hospitals are equipped with the most modern utilities —electrical equipment, water supply, sewage disposal plants and systems, heating, laundries, kitchens and fire protection.

The following general hospitals have been completed recently:

Hospitals	Bed Capacity
Barnes General Hospital, Vancouver Barracks, Washington	750
Lawson General Hospital, Chamblee, near Atlanta, Ga.	2,000
LaGarde General Hospital, New Orleans	1,000
Stark General Hospital, Charleston, S. C.	1,000
Hoff General Hospital, Santa Barbara, Calif.	750
Billings General Hospital, Fort Benjamin Harrison, Ind.	1,000

At the Stark General Hospital—generally regarded as a model institution in the South—four accessory buildings are to be constructed. They are a hospital barracks, Red Cross recreation building, ambulance garage and administration building. The hospital takes up 30 acres of ground and is surrounded by a 319 acre tract also owned by the government.

The hospitals still under construction are as follows:

Hospitals	Date of Completion	Bed Capacity
O'Reilly General Hospital, Springfield, Mo.,	Aug. 24, 1941	1,000
Tilton General Hospital, Fort Dix, N. J.,	uncertain	1,000
Lovell General Hospital, Fort Devens, Mass.,	uncertain	1,000

The following are the long-established general hospitals of the army in continental United States:

Hospitals	Bed Capacity
Letterman General Hospital, San Francisco	1,204
Fitzsimons General Hospital, Denver	1,458
Army and Navy General Hospital, Hot Springs, Ark.	412
Walter Reed General Hospital, Washington, D. C.	1,184

ARMY'S PHYSICAL THERAPY COURSE TO BE SHORTENED

Because of the great demand made on the Army's Physical Therapy School for trained personnel to staff new hospitals, the school's one year course for physical therapy aids will be reduced to six months on July 1. It is contemplated that the students will then be sent to Army hospitals for an additional six months of practical supervised training. The school is conducted at the Army Medical Center, Washington, D. C., and has graduated two hundred and twenty-five young women since it was inaugurated in 1922.

GENERAL WILLIS TO COMMAND REPLACEMENT CENTER

Brig. Gen. John M. Willis, M. C., United States Army, has been assigned to command the Medical Department Replacement Center at Camp Grant, Rockford, Ill.

ORGANIZATION SECTION

PROCEEDINGS OF THE CLEVELAND SESSION

MINUTES OF THE NINETY-SECOND ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION, HELD IN CLEVELAND, JUNE 2-6, 1941

HOUSE OF DELEGATES

First Meeting—Monday Morning, June 2

The House of Delegates convened in the Euclid Ball Room of the Hotel Statler and was called to order at 10 a. m. by the Speaker, Dr. H. H. Shoulders.

Preliminary Report of the Reference Committee on Credentials

A preliminary report of the Reference Committee on Credentials was submitted by the chairman, Dr. G. Henry Mundt, Illinois, who reported that one hundred and thirty delegates with proper credentials had registered.

Dr. Mundt moved that Drs. A. R. McComas and R. L. Diveley, Missouri, whose names are included on the official list but who did not present credentials, be seated. The motion was seconded by Dr. A. T. McCormack, Kentucky, and carried.

Dr. Mundt later stated that additional delegates with proper credentials had registered, making a total of one hundred and fifty-two at this time.

Roll Call

The Secretary called the roll and announced that a quorum was present.

Distinguished Service Award

Dr. Arthur W. Booth, Chairman of the Board of Trustees, presented the following report:

The Committee on Distinguished Service Awards of the American Medical Association submitted five names to the Board of Trustees. In accordance with chapter VI, section 5, of the By-Laws, the Board has selected by ballot the following names for presentation to the House of Delegates in alphabetical order: Dr. James Ewing, New York; Dr. Simon Flexner, New York, and Dr. Ludvig Hektoen, Chicago.

The Speaker appointed as tellers Drs. Samuel J. Kopetzky, New York; Olin H. Weaver, Georgia; Leon J. Menville, Louisiana; B. F. Cook, Vermont, and Henry Cook Macatee, District of Columbia.

The tellers spread the ballot, and the Secretary announced that one hundred and fifty-two votes had been cast, of which Dr. Ewing received ninety-one, Dr. Flexner fourteen and Dr. Hektoen forty-seven.

The Speaker declared Dr. James Ewing, who received a majority of the votes cast, to be elected by the House to receive the Distinguished Service Award of the American Medical Association.

Adoption of Minutes of New York Session

On motion of Dr. A. T. McCormack, Kentucky, seconded by Dr. John Z. Brown, Utah, and carried, the House dispensed with the reading of the minutes and adopted the minutes as published.

Address of the Speaker, Dr. H. H. Shoulders

The Vice Speaker, Dr. R. W. Fouts, Omaha, presided while the Speaker, Dr. H. H. Shoulders, read his address, which was referred to the Reference Committee on Reports of Officers:

Mr. Speaker, Members of the House of Delegates and Guests:

I wish first to express to the members of the House my appreciation of the honor and privilege of greeting you again as your presiding officer. I wish especially to acknowledge my indebtedness to you for your forbearance toward my shortcomings.

It is the desire and purpose of your Speaker to cooperate with the membership of the House in such a way that the actions taken on every matter presented will truly reflect the deliberate judgment of the House. Trick parliamentary procedures may have a place in political assemblies, but not here.

At this time I wish to pose a question and then answer it very briefly. The question is this: Whom do you, as Delegates, represent? It is more accurate to state the question in this form: What interest or interests do you represent? It is true, of course, that you represent the more than one hundred and eighteen thousand doctors who sent you here. But what interest of theirs do you represent? Is it a selfish pecuniary interest? Or is it their ideas and ideals with regard to medicine as an agency for human welfare?

A Representative in the national Congress represents the interests of his constituents. It appears that their political and economic interests are uppermost in his mind. His effectiveness as a representative, it seems to me, is too often measured by the number and the amount of the appropriations he obtains for projects in his district. You represent no such interest. You make no such appropriations. You do not even vote as to the amount of the fee a single constituent you represent may charge for a single item of service he may render. Furthermore, your effectiveness as a representative cannot be measured in terms of financial or political benefits to your constituents, either direct or indirect. A careful review of the actions of this House on many matters touching this question, over a long period of years, it seems to me, would lead any unbiased person to the conclusion that it is the ideas and ideals of the medical profession with regard to medicine which you represent, and that in no sense do you represent the selfish pecuniary interests of doctors. It is true that you represent the science and art of medicine as an agency for human welfare. You do not, however, represent doctors as the owners of the science of medicine. Doctors do not, and have never pretended that they do, own the science of medicine.

When Abraham Lincoln died, a member of his cabinet walked from the room and said "Abraham Lincoln now belongs to the ages." That phrase, in my opinion, correctly expresses the ownership of the science of medicine. It truly belongs to the ages. Too many different individuals in too many different countries in too many different ages of the world have made contributions to the science of medicine for any nation or any group of citizens anywhere to lay claim to its ownership.

The relationship of the organized profession of medicine to the science of medicine is recognized by all of us as a trusteeship. The attitude displayed by the profession to the science through the ages has been that of a trustee in every sense of the word—guarding with diligence and fidelity something of value for the benefit of others. This book of science has been kept wide open by reason of policies and principles enunciated by this House and observed by the profession. You have erected no barrier of any character which stands in the way of the appropriate use of any medical discovery of proved benefit to a sick person or the public health. On the contrary, your actions have prevented that very thing from happening. In addition you have promoted progress under the influence of such restraints and guidance as make progress safe.

It is to be remembered that the science of medicine, in reality, embraces portions of several sciences, such as chemistry, biology and bacteriology. These are of no earthly use to ailing humanity until they have gone through the long and tedious process of adaptation by which they are made applicable to human needs in a way that is most beneficial and least dangerous. We know better than most people that "everything that is potent for good is also potent for evil." Even the tongue may do harm when "not bridled." The bridle is not used just to stop a horse: it is used to guide him in the way he should go in service and duty. The art of medicine, of course, is an individual accomplishment. The art or skill, if you please, of using a scalpel for the relief of an ailment is as truly an individual accomplishment as the ability to paint a picture or fashion a statue of marble or bronze.

You represent the art of medicine, but in no sense do you represent any selfish interest of the art. You represent those who have by years of study and effort acquired the art. But you do not represent and have never promoted their selfish use of it. In a very real sense you represent the public interest in this science and this art. This public interest has been the concern of the profession and your primary concern in every expression of principle enunciated by you in relation to the application of this science and this art to human needs.

This is a brief and very inadequate statement of the interests you represent. It does in a measure answer the question put. In my opinion all these interests have been represented in this House in such a way as to stimulate a sense of pride in each of us at this moment. It is natural and proper that you should desire and even expect approval of your actions by each and every interest you have so faithfully represented. Your appeal for such approval, however, has been and must be addressed to the higher elements in human nature. You could not address an effective appeal to the lower instincts, if you felt inclined to do so, for the simple reason that you do not possess the means for such an appeal.

Your task is difficult, of course. It is difficult by reason of the nature and variety of all the interests you represent. It calls for qualities of leadership which, to say the least, are a bit unusual at the present time, and an attitude toward your task which is all too unusual. It requires not only a broad knowledge of the broad subject of medicine and its proper uses in relation to human needs, it requires a degree of integrity which money cannot tempt and flattery cannot influence. It requires a courage which stands firmly against odds, apparently overwhelming. It requires wisdom that is born alone of experience. It requires the virtue of charity akin to that which uttered the prayer "Father, forgive them, for they know not what they do." It requires the ability to see human nature as it is: its virtues and its faults; its generosity and its greed; its loves and its hates; its strength and its weakness; its hopes and its fears. It requires vision—a vision which penetrates this tangled maze of conflicting attributes of human nature and envisions the future.

In conclusion may I venture the opinion that the profession of medicine throughout the world, and an increasing number of enlightened lay people in our own land, are placing an increasing faith in and reliance on you for leadership in the solution of problems requiring medical statesmanship.

In Memoriam

In accordance with the established custom of the House of Delegates of taking official notice of the death of Fellows who have served the Association in official capacities, either as members of the House or as officers of the Association, the Speaker called the roll of those who have passed away since the House met in June of 1940, as follows:

(The dates following the names indicate years of service in House or year or years in which officers held official positions.)

Lemuel P. Adams, California, 1925.
Floyd J. Atwell, New York, 1937-1938.
William C. Braisted, U. S. Navy, President-Elect 1919-1920; President 1920-1921.
Roger Brooke, U. S. Army, 1938.
Bertram L. Bryant, Maine, 1920-1923; 1925-1928; 1930-1933.
Joseph T. Buxton, Virginia, 1920; 1922; 1924.
Willis C. Campbell, Memphis, Tenn.; Section on Orthopedic Surgery 1939.
Guy S. Carpenter, New York, 1940.
E. E. Cornwall, New York, 1911-1912.
Walter F. Enfield, Pennsylvania, 1923.
William L. Estes, Pennsylvania, 1909.
Louis Frank, Kentucky, 1918.
E. J. Goodwin, Missouri, 1909-1918; 1925-1934.
C. A. Gray, Texas, 1928.
William W. Harper, Alabama, 1928.
Willis F. Hart, Maine, 1918.
John A. Hatchett, Oklahoma, 1905-1906. Second Vice President 1908.
Austin A. Hayden, Chicago. Treasurer 1922-1933; Trustee 1933-July 10, 1940.
Emory Hill, Virginia, 1924; Section on Ophthalmology 1934-1936.
Edgar A. Hines, South Carolina, 1910-1928; 1930-1940.
Charles R. Hume, Oklahoma, 1918-1919.
Charles E. Humiston, Illinois, 1915-1916; 1918-1919; 1921-1935 Special Session. Member Council on Medical Education and Hospitals 1930-1937.
R. D. Kennedy, Arizona, 1928-1929.
Hermann J. G. Knobs, South Dakota, 1919.
Le Roy Long, Indian Territory, 1903-1904; Oklahoma, 1920.
John J. McGovern, Wisconsin, 1913-1914.
F. Clifton Moor, Florida, 1934.
Fred Moore, Iowa, 1927; 1931-1940. Member of Council on Medical Education and Hospitals 1934-April 8, 1941.
Arthur C. Morgan, Pennsylvania, 1911; 1929-1938.
John P. Munroe, North Carolina, 1915.
Oliver T. Osborne, New Haven, Conn., Section on Materia Medica, Pharmacy and Therapeutics 1902-1903; Section on Pharmacology and Therapeutics 1908.
Ira N. Pickett, Nebraska, 1905-1906.
William Allen Pusey, Chicago, Section on Dermatology 1910; 1914. Treasurer 1911-1922. President-Elect 1923-1924; President 1924-1925. Illinois delegate 1926-1932.
Charles B. Reed, Illinois, 1933-1940.
Charles Richard, U. S. Army, 1907; 1914.
Andrew F. Richards, Tennessee, 1917-1918.
Stewart R. Roberts, Georgia, 1916-1920.
Joseph W. Scherescheswsky, U. S. Public Health Service, 1918-1922.
Alfred J. Scott Jr., California, 1934; 1936.
Arthur C. Scott, Texas, 1911; 1924-1927.
Harry C. Sharp, Indiana, 1909.
Dudley Smith, California, 1927-1930; 1932.
Elsworth S. Smith, Missouri, 1920.
Richard R. Smith, Michigan, 1911-1912.
Howard L. Snyder, Kansas, 1936-1940.
John G. South, Kentucky, 1920-1921.
Thomas S. Southworth, New York, Section on Diseases of Children 1907.
C. E. Stackhouse, North Dakota, 1935 Special Session.
Charles Stover, New York, 1908; 1910.
Magnus A. Tate, Ohio, 1923; 1925-1928.
Samuel J. Waterworth, Pennsylvania, 1917; 1926; 1928.
Horace G. Wetherell, Colorado, 1910; 1912. Section on Obstetrics and Gynecology 1917-1918.
Charles J. Whalen, Illinois, 1915-1918; 1920-1940.
Carl Lewis Wheeler, Kentucky, 1913; 1916-1919. Section on Urology 1922.
William V. Whitmore, Arizona, 1910.
William N. Wishard, Indiana, 1902-1910. First Vice President 1918.
Thomas A. Woodruff, Chicago. Section on Ophthalmology 1909-1910; 1913. Third Vice President 1908.

As was so well said of another who died, as they did on the field of duty, we can truthfully say of each of our departed associates and friends:

> When a star is quenched on high,
> For ages will its light
> Still travel downward from the sky,
> Shine on our mortal sight.
> So, when a good man dies,
> For years beyond our ken
> The light he leaves behind him lies
> Upon the path of men.

On motion, duly seconded and carried, the delegates arose and stood in silent tribute to the memory of the deceased delegates and officers.

Reference Committees

The Speaker announced the personnel of the Reference Committees. Included in the list which follows is the personnel of a Reference Committee on Military Preparedness, the appointment of which was later authorized by the House:

SECTIONS AND SECTION WORK

George W. Kosmak, Chairman.....New York
David D. Scannell.....Massachusetts
Hilton S. Read.....New Jersey
Rollo K. Packard.....Illinois
B. J. Hein.....Ohio

RULES AND ORDER OF BUSINESS

Thomas F. Thornton, Chairman.....Iowa
Floyd S. Winslow.....New York
James Q. Graves.....Louisiana
Joseph F. Smith.....Wisconsin
E. N. Roberts.....Idaho

MEDICAL EDUCATION

Walter G. Phippen, Chairman ..... Massachusetts
Elbridge J. Best ..... California
Carl R. Steinke ..... Ohio
Louis A. Buie ..... Section on Gastro-Enterology and Proctology
Wingate M. Johnson ..... North Carolina

LEGISLATION AND PUBLIC RELATIONS

Henry A. Luce, Chairman ..... Michigan
F. J. Pinkerton ..... Hawaii
John H. Fitzgibbon ..... Oregon
Terry M. Townsend ..... New York
F. S. Crockett ..... Indiana

HYGIENE AND PUBLIC HEALTH

Arthur T. McCormack, Chairman ..... Kentucky
Warren F. Draper ..... U. S. Public Health Service
Lewis B. Bates ..... Isthmian Canal Zone
L. W. Larson ..... Section on Pathology and Physiology
William D. Johnson ..... New York

AMENDMENTS TO CONSTITUTION AND BY-LAWS

William Weston, Chairman ..... Section on Pediatrics
Edward M. Pallette ..... California
Edmund R. Brush ..... Ohio
J. N. Baker ..... Alabama
Walter W. King ..... Colorado

REPORTS OF OFFICERS

C. W. Roberts, Chairman ..... Georgia
H. G. Hamer ..... Indiana
L. G. Christian ..... Michigan
A. R. McComas ..... Missouri
Walter B. Martin ..... Virginia

REPORTS OF BOARD OF TRUSTEES AND SECRETARY

Francis F. Borzell, Chairman ..... Pennsylvania
F. J. Savage ..... Minnesota
Robert A. Peers ..... California
William R. Brocksher ..... Arkansas
Meredith Mallory ..... Florida

CREDENTIALS

G. Henry Mundt, Chairman ..... Illinois
Arthur J. Bedell ..... Section on Ophthalmology
Raymond L. Zech ..... Washington
J. Newton Hunsberger ..... Pennsylvania
A. P. Nachtwey ..... North Dakota

MISCELLANEOUS BUSINESS

Charles G. Strickland, Chairman ..... Pennsylvania
Frederic E. Sondern ..... New York
Holman Taylor ..... Texas
Charles E. Kiely ..... Illinois
Andrew F. McBride ..... New Jersey

EXECUTIVE SESSION

Thomas A. McGoldrick, Chairman ..... New York
Charles H. Henninger ..... Pennsylvania
Deering G. Smith ..... New Hampshire
E. S. Hamilton ..... Illinois
Guy W. Wells ..... Rhode Island
E. G. Wood ..... Tennessee
James R. Miller ..... Connecticut

MILITARY PREPAREDNESS

Harvey B. Stone, Chairman ..... Maryland
James E. Paullin ..... Section on Practice of Medicine
Sam E. Thompson ..... Texas
John H. O'Shea ..... Washington
Samuel J. Kopetzky ..... New York
E. H. Skinner ..... Section on Radiology
Joseph F. Smith ..... Wisconsin

SERGEANTS AT ARMS

A. A. Ross ..... Texas
Frank E. Reeder ..... Michigan
John Z. Brown Sr. ..... Utah

Address of President Nathan B. Van Etten

The Speaker resumed the chair and presented the President, Dr. Nathan B. Van Etten, New York, who delivered the following address, which was referred to the Reference Committee on Reports of Officers:

Mr. Speaker and Members of the House of Delegates:

It is impossible to suppress an emotional regret that this is my valedictory. Although my bones are old, my spirit is still inquisitive. Fifty years of medical practice during a period of almost incredible scientific revelations stimulates a longing to see the unpredictables of the next half century. As the curtain is partly lifted on scenes of new therapy, of new developments in immunology, of new and daring surgery, of new social science, of new adventures into the mysteries of human behavior, of inevitable readjustment of world geography, one can neither fold one's hands and close one's eyes in complacent retrospection nor suppress resurgent anxiety over our immediate social future.

PROGRESS IN MEDICINE

The American Medical Association has attained the dignity of age as it has grown from a small group of founders in 1846 to its present stature of one hundred and eighteen thousand members. Ninety-five years of progress present an inspiring panorama. The triumphs of optimism, the evolution of science, the insistence on the highest possible qualification of the doctor of medicine, the romance of the physician as he progressed from empiricism to scientific controls and from the saddle bag to the automobile stimulate dreams of wonder as to whether the century ahead can be as remarkable as the century just past.

One must credit the founders of 1846 with being just as up to date as you are in 1941 as you view with amazement new discoveries which may completely change your conception of medical practice. Postgraduate education has as great importance for the physician of 1941 as it had for his predecessor of 1846. Unless the physician of 1941 is alive to the unfolding medical and surgical drama, he will find himself so far behind the procession that he will be unable to keep step with a public which is trying to understand the sensational revelations which are broadcast in the daily press.

I am profoundly grateful to the House of Delegates of the American Medical Association for many opportunities to share the responsibility of forming some of the policies of American medicine these many years and for selecting me as an official messenger to all American physicians two years ago. These are the greatest privileges that can be given to any American physician. In this room in 1934, as chairman of a reference committee, I had the honor to present for your approval a ten point program which seems to have stood the test of the last seven turbulent years. It has survived severe criticism especially directed at one of its essentials, "free choice of physician." Some self-esteemed persons have admitted that freedom to choose a doctor was quite right for themselves as they carried their arthritis to Philadelphia or Boston, their surgery to outstanding operators and their eyes to the best ophthalmologists. Their denial of the value of free choice applies only to other less fortunate persons. Mass medicine is wonderful for everybody except themselves. They would prescribe but cannot swallow their own medicine.

In 1939 you formulated an eight point platform which stems from the program of 1934. The essence of this platform is centralization of national health functions and decentralization of individual sickness under local control. The platform has had wide approval and at the present moment Washington health bureaus are operating under the coordinating directions of the Federal Security Administrator. This is perhaps the logical manner of correcting a multiplication of health functions distributed through many agencies in many government departments and may be the answer to the prayer of the Delegates of 1875, which was reaffirmed in 1939, even though it required a world convulsion to accomplish it.

This matter has been discussed freely during the past two years, and a bill to create a National Department of Health was introduced in the House of Representatives by Mr. Pfeiffer of New York in 1939. This bill was referred to the Committee on Administration Expenditures and died there. It was reintroduced in 1941. The Federal Security Administrator has strongly advocated the establishment of a National Health Department to be headed by an officer of Cabinet rank. Other statesmen have expressed favoring opinions. I commend this matter to your careful and appropriate action. A National Health Department is now functioning—without the title and without its director in the cabinet of the President. I trust that the national emergency will at least result in the permanence of this new government reorganization. It is a safe prediction, however, that this new alinement of Washington bureaus will be violently opposed by officials who will fear loss of place or prestige. If this House continues to favor the establishment of a National Health Department, it must continue to fight for it.

CENTRALIZATION OF GOVERNMENT HEALTH FUNCTIONS

I am in complete disagreement with those who claim that centralizing what are now government health functions means more state medicine. In a federacy of forty-eight states certain blanket powers such as those needed to protect state lines in the instance of the dangers of spreading communicable disease would be most desirably concentrated in a single agency. The migrating indigent as he moves from state to state carrying his diseases along with his poverty presents health problems that cannot be controlled successfully by state governments. The protection of all our frontiers from invasion by those who may bring physical or moral or mental disease and become public menaces and public charges cannot be the responsibility of state government.

The Veterans Health Administration, which will inevitably expand to vast proportions, must be a national problem; it is really state medicine and should be. On the other side of the question, your platform of 1939 recognizes that individual sickness cannot wait for the state capitol or Washington to diagnose, segregate or prescribe; it must be treated on the spot, when it is discovered, in the smallest political subdivisions and controlled by the local medical profession.

POLICIES OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association has been subjected to attack by certain groups with special interests as a selfish, reactionary, antisocial and restraining influence, opposing the activities of those who desire to practice group or cooperative medicine or any new plans for the delivery of medical care; it is accused of indifference and inertia in its attitude toward public health agencies. The language of these attacks declares, in the words of a New York newspaper of Tuesday, May 6, 1941, that the American Medical Association believes "that everything is right as rain" concerning the health of the underprivileged or the indigent or the unfortunate who cannot afford to pay for any medical care. This descent from the truth to mud slinging in order to illuminate an inspired article is interesting to you members of the House because you know that the American Medical Association, whose policies you form, desires for the American people only the best service for their best interests and their protection from any form of quackery which would exploit them when they are sick, and favors public health measures under proper auspices which can be used to keep them well and prevent infection regardless of race, creed, class or financial competence. The same article colors its argument with arraignment of "the old guard of organized medicine" or "the top clique of the American Medical Association" or the "American Medical Association hierarchs." This should interest you members of the House of Delegates for the reason that if there is such a thing as "the old guard of Organized Medicine" you compose it. If there is such a thing as "the top clique of the American Medical Association" you are it. If there are "American Medical Association hierarchs" you are they.

The old idle talk about a small group of persons in Chicago, or sometimes one person, as dictating the policy of the American Medical Association still goes on. If there are any dictators in American medicine you are, because you alone are responsible for making our policies. Your elected officers are merely your executives.

Why do otherwise intelligent persons and some physicians continue to believe these old stories? I have heard them for more than twenty-five years. In some manner we must be failing to present a clear and convincing picture of our organization. Can you not take the trouble to convince the people who sent you here and whose interest you serve that this is the most democratic of all democratic organizations? Can you not tell them that no one else delegated you to sit in this House and endowed you with power but the members of your county medical societies who sent you to your state societies, from which you were chosen for your high office? Can you not take the trouble to enlighten public opinion at your homes through your local newspapers and develop a consciousness of the realities of local health needs and promote them? Can you not tell the world that the loyalties of organized medicine are even more altruistic today than they have ever been before?

I have sat with your Trustees for eight years and I have observed the meticulous and exhausting patience with which they try in every way to carry out the spirit and the letter of the authorized actions of this House. Your Trustees handle your affairs without personal bias. They come from all regions of the country at great personal sacrifice, some of them every month, to concentrate their best intelligence on the execution of your decisions. Only one of them, Dr. Irons, lives in Chicago. Dr. West, Dr. Fishbein and Mr. Braun are executives. I have never heard or seen any of them attempt to originate any policy of the American Medical Association. I have heard these men called a "Triumvirate of Dictators." Mr. Braun could double your advertising if you would let him. Ethical advertising could yield to large volumes of uncensored advertising. Dr. Fishbein could travel in far more attractive financial fields than in those in which he is limited by his strict loyalty to the service of American medicine, to which he has dedicated his brilliant talents. Dr. West has been called a "Pooh-Bah" by some loose thinking space writers, possibly because he has been inflexible in his devotion to the principles that have been evolved in this house. He has frankly and forcibly expressed his convictions on many occasions, but he has never dictated policy.

Authors whose mental processes seem to have been influenced by Moscow or Berlin have written volumes of destructive criticism concerning the policies of the American Medical Association and the personalities of your executives. If these strictures on these characters who are so vital to the success of your organization have gained any credit in your minds, you should bring your doubts or your questions before the House for appropriate action. If you deny the truth of these allegations, you should at this time express your high appreciation of their unselfish devotion.

THE COMMITTEE ON MEDICAL PREPAREDNESS

At your session in New York last June the government of the United States made a formal request for help in the mobilization of medical personnel for national defense and you authorized the Speaker to appoint a nationwide Committee on Medical Preparedness. This committee has been at work for a year with a resulting mass of tabulated information that justified its existence and revealed that 95 per cent of American physicians are loyally willing to support the military services of the United States when and where they may be needed. This extraordinary record of patriotic expression strikes a high note of enthusiasm for the preservation of the integrity of our national existence and denies the claims of discord within the ranks of medicine which have been made by a few physicians, who have openly declared that our entire social structure must be leveled and rebuilt after the communistic manner. There can be no room in organized medicine for destructive ideologists if we are to continue to believe in the cohesive altruism which has survived the social revolutions of the centuries and which is now carrying us to still higher planes of public service. Our professional honor must never become a political football or be involved in interracial, interreligious or international battles that threaten our high position as a scientific and humane body. As Americans we must stand for whatever is best for America. As physicians we must stand for the best of mental, moral and physical health for all the world.

Address of President-Elect Frank H. Lahey

The Speaker presented the President-Elect, Dr. Frank H. Lahey, Boston, who delivered the following address, which was referred to the Reference Committee on Reports of Officers:

Mr. Speaker and Members of the House of Delegates:

As I see my responsibility in this address, it consists of calling your attention to things which have come to my mind while in the position of President-Elect, as I have been during the last year, and while interested and participating in the activities of the American Medical Association, as I have been for the past several years.

It has always interested me that an organization as large as the American Medical Association in terms of its membership, in terms of the number of people employed in it and in terms

of the income and expenditures involved in its conduct, and as broad and as varied as are, of necessity, its interests could be run as well as it is. It is additionally surprising that it functions as satisfactorily as it does—and we all admit that it functions very satisfactorily—in view of the fact that its destinies are controlled and directed by a group of men whose primary interest is scientific and who have, in addition, many unavoidable local responsibilities and, behind all of that, the need of raising and supporting families. Furthermore, it has always seemed to me that the American Medical Association has functioned surprisingly well when so much of the work must be done by paid representatives in extremely peculiar positions. They must direct really large affairs without final authority and without establishing a bureaucracy. They must please a vast majority but still maintain a large amount of independence of thought and action. In view of the peculiarity of this situation, it seems to me that the American Medical Association has been conducted very well. In the conduct of its affairs it has made mistakes, but they have been largely those of minor magnitude. No really gross mistake in the way of policy or management can truly be charged against this Association.

I have repeatedly thought as I have watched the functioning of the American Medical Association from within its executive circles that no one can possibly really evaluate what the American Medical Association has done for American medicine and, through that, for world medicine by its various activities without having lived intimately with the inner workings of the American Medical Association. For one to appreciate fully these values, the American Medical Association would really have to be destroyed and the country would have to exist without it over a period of time. The American Medical Association is undoubtedly not unlike a good wife—only fully appreciated when lost. We are all so adjusted to the aid, the resources and the helpful facilities of the Association that we tend, I believe, to make the mistake that is so often made by unappreciative husbands who think of their good wives much as they think of a comfortable piece of furniture. Not only does this thought, it seems to me, relate itself to those of us within medicine who benefit from its help and existence but, with even greater probability of the truth of the statement, by the lay public and by the government itself.

I have watched many of my friends pass through the occupancy of the position of President of the American Medical Association, and I have always promised myself that when the opportunity arose I would direct attention to the pressing need of protecting those men who occupy that position from the necessity of seriously affecting their health during that period. It is, I believe, extremely important not to place the responsibility of overconscientious fulfilment of the duties of this position on the shoulders of those who occupy it. They must of necessity always lean over backward in their desire to fulfil what they believe to be their obligations. They need your protection.

State societies, postgraduate meetings and local societies have properly, but naturally, one purpose; that is, to make their meetings the greatest possible success. They have no knowledge of the demands on the President's time and therefore no consideration for his health. They are conscious only of the immediate need for the success of their meeting. They have no knowledge or great interest in the number of engagements the President of the American Medical Association may have. Thus the tendency of the President, in his desire to satisfy every one, is to overdo.

There is therefore a need for assistance from the Association in publicizing to the state societies the necessity for the President of the American Medical Association to care for his health, and that this responsibility should not be entirely placed on the occupant of the position lest it be interpreted as a lack of willingness on his part to undertake all the obligations he should.

None of these suggestions have anything to do with me personally. I do not need the help, because I happen to be so constituted as to be able to decide for myself what is and what is not proper, and what I can and cannot do within reason. I happen also to be so independently situated that I can take a position regarding obligations and stand on it. I am particularly impelled to speak of this because of the record as to the health of past presidents at the completion of their terms of office, because it has been so bad and because I wish to do something constructive for those who are to follow me.

I am probably as well able to handle this situation as almost any one, provided as I am with a large amount of clerical and professional help and with patients already well trained and adjusted to my frequent absence. Before occupying this position I had already become well immunized to travel, public addresses and a trouper-like existence. But even in the face of all this, when it is, as it is at times, difficult for me, I appreciate what it must be for a man practicing as an individual. It should not be necessary for a president of the American Medical Association to give up his practice. It should not be necessary to limit the selection of presidents of the American Medical Association to those who are giving up their activity in medicine and who are losing touch with active affairs. This is not what we should want. The men who are presidents of the American Medical Association should be men who are actively living with the live problems, not those who are tending to approach them from a sequestered and philosophic point of view.

While I am on this subject I should like to suggest that society meetings and nonprofessional groups may possibly be demanding too much of the time of some of our paid executives at headquarters in Chicago. It must likewise be a considerable tax on their nervous and physical energy, as has been stated in relation to the President. Must not those who occupy important executive positions at our headquarters be given the same consideration that presidents of the Association are given? With the demands for them at many meetings, may it not also become essential for them to decide whether or not the increasing burdens and responsibilities at headquarters necessitate their accepting less traveling and speaking engagements? May it not even be possible, as a suggestion, that the printed word, involving as it does the opportunity to measure carefully and evaluate its meaning before finally put into print, may be a more sound and safe way to publicize the activity of our society without the possibility of promotion of undesirable, critical reactions?

Probably few men have had a greater opportunity to interpret the reactions of the medical public throughout America than have I. I can truthfully say, and I am pleased to be able to state it to you, that the reactions of the medical public in America to the activities of the American Medical Association are with few exceptions extremely approving and appreciative. Having occupied various positions in the American Medical Association—as an officer of a section and as a member of the Council on Scientific Assembly and later of the Council on Medical Education and Hospitals—and having attended so many meetings in intimate contact with those giving so generously of their time to the conduct of these meetings, and at the same time sitting outside the circles of active participation in the House of Delegates and the other activities of the Association, I have been able to develop at this distance some ideas which I can at least mention to you. One that has occurred to me is the necessity of selecting young men as representatives in the House of Delegates of the American Medical Association and as members of various important committees of the House of Delegates. One of the greatest mistakes, it has always seemed to me, in the executive management of large affairs has been to put complete control into the hands of an older group of men and to fail to realize that there must be developed, by experience and by contact with problems, a constant supply of younger men. They secure from this experience the ability to take over the reins when the older men no longer are active. It has been my experience to see so many institutions, business and professional, come to a bad end through failure to appreciate this point. It will always be necessary for growing organizations to have fresh points of view as well as fresh, youthful representation, and to develop men interested in the organization side of medicine early in their careers.

With a full realization of the delicacy of the situation, yet with an equal realization of my responsibility to speak my mind as the representative of such a large body of men, and because I am so sincerely interested in seeing the American Medical

Association continue to occupy not only the place it does in American medicine but an even greater one, I am impelled to make the statement that is so outstandingly a conviction in my mind that it is extremely desirable that we be ever conscious of the fact that the Presidency of the American Medical Association should largely seek the man and not the man the position. Too much competition in the selection of men for President of the American Medical Association is injurious to it and, even more important, particularly injurious to the position that it does and must occupy in the minds of the American public.

It would be improper in an address to this group of men, who play such an important part in shaping and maintaining the policy of American medicine, if I were not to compliment the American Medical Association and other branches of medicine, such as the American College of Surgeons, the American Hospital Association and the specialty boards for their widening development of unselfish cooperation in the interests of better medicine now and for the future. We should all be conscious of the fact that what appeared to be in the beginning natural hostilities have been overcome in time. A better acquaintance of these groups with one another is constantly smoothing out difficulties which have in the past played a considerable part in slowing the progress of development and in preventing the accomplishment of changes of real advantage. The way has undoubtedly been cleared considerably by the elimination of personalities, which are natural and apparently inevitable, but which in the past generation undoubtedly have so hampered this progress which is so desirable.

I cannot close my remarks to this group without at least making a brief mention of the national situation. If we are frank with ourselves, and now certainly in this period it is desirable to be so, there are few of us who do not feel a sense of injustice regarding the attitude of the government toward organized medicine. I say this not in order in any way to be critical of government or of those who have to do with what a majority of us would consider injustices, but rather to plead that these are but trivial and possibly necessary features in our existence in these trying times. I mention them solely with the purpose to plead that they be not permitted to occupy any prominent position in our minds and to urge that we forget them and look toward the more urgent and important things at the present time, as I will state in my presidential address. Soon there will be made, and these remarks were written before it was made, a most important decision for this country and that is what is to be its position as relates to the world conflict. Suits, privileges, personalities, personal opinions in the light of that decision will, and should, occupy minor positions. The things that will need to be settled then will be: Can we subordinate our differences to the national need? Can we have that all important need in a conflict, national unity? Can we eliminate from our minds what we should like to have for what must be? That will be a real test of the democratic form of government. If we permit relatively unimportant trivialities to becloud our vision of this all important problem or if we permit personalities and personal differences to prevent us from giving wholehearted support to our country in this national emergency, we shall properly belong to that group so well described by Sir William Osler, who said "Only to the small is the trivial great."

REPORTS OF OFFICERS

Report of the Secretary

Dr. Olin West, Secretary, presented his report as printed in the Handbook, which was referred to the Reference Committee on Reports of Board of Trustees and Secretary.

Report of Board of Trustees

Dr. Arthur W. Booth, Chairman, presented the report of the Board of Trustees as presented in the Handbook as well as the following supplementary report, which were referred to the Reference Committee on Reports of Board of Trustees and Secretary:

Pan American Relationships

During the past year the Board of Trustees has had brought to its attention on several occasions the importance of the establishment of cordial relations and scientific interchange with our colleagues in South America, Central America, Cuba, Puerto Rico, Mexico and Canada. The Council on Scientific Assembly has had before it the question of arranging for suitable representation by these visitors on the scientific programs of the annual session. Several conferences have been held with the Coordinator for Pan American Affairs in Washington. The Board of Trustees has been impressed with the importance of facilitating further cooperation of this type in the interest of scientific advancement and unity of the American continents.

Report of Treasurer

Dr. Herman L. Kretschmer, Treasurer, presented his report as printed in the Handbook, which was referred to the Reference Committee on Reports of Board of Trustees and Secretary.

Report of Judicial Council

Dr. George Edward Follansbee, Chairman, presented the report of the Judicial Council as presented in the Handbook, as well as the following supplementary report, which were referred to the Reference Committee on Reports of Officers:

Revision of Constitution and By-Laws and of Principles of Medical Ethics

Several items arising from the activities of the 1940 session of the House of Delegates, held in New York City, among them rewriting of the Principles of Medical Ethics and the revision of the Constitution and By-Laws with respect to membership and Associate Fellowship, have received the continuous attention of the Judicial Council during the past year. The Council is still of the opinion that the general state of the country and of the medical profession itself is so unsettled and confusing that no material change in either the Principles of Medical Ethics or the Constitution and By-Laws should be made until clarification of conditions takes place and more stability is established.

As instructed by the 1940 House of Delegates, the Judicial Council has devoted study to the proposal to consider representation of scientific sections in the House on a basis of their minimum registration at annual sessions.

The last reapportionment of delegates was made effective in 1941 and remains in effect through 1941, 1942 and 1943, at which time a new apportionment must be made for the 1944, 1945 and 1946 sessions of the House.

The Council believes that the number of angles involved in an equitable solution of this question justifies postponement of the Council's report on these matters until the 1942 session of the House of Delegates.

Report of Council on Medical Education and Hospitals

Dr. Reginald Fitz, Acting Chairman of the Council, presented the Report of the Council on Medical Education and Hospitals as presented in the Handbook, together with the following supplementary report:

Tribute to Dr. Fred Moore

The members of the Council on Medical Education and Hospitals record with deep sorrow and regret the death of Dr. Fred Moore of Des Moines, Iowa, which occurred on April 8.

Dr. Moore was born in Harlan, Iowa, May 10, 1883; received the degree of M.S. from the University of California in 1907; studied medicine at Western Reserve University and at the State University of Iowa College of Medicine from 1907 to 1911, receiving the degree of doctor of medicine from the latter institution in 1911. He served an internship at the Montreal General Hospital and in 1914 engaged in further studies in Baltimore. Dr. Moore had been a practitioner in Iowa since 1911 and for many years limited his practice to pediatrics. He had an office in Des Moines since 1915. He was director of the health department of the public schools of Des Moines and was on the staffs of the Iowa Methodist, Iowa Lutheran and Mercy hospitals.

Dr. Moore was completing the last year of a seven year term as a member of the Council on Medical Education and

Hospitals. He showed great interest in the work of the Council and until his illness had a perfect record of attendance at its meetings. In his early years as a member he listened and learned and in a short time his high ideals, tempered by a sympathetic understanding, together with his determination to maintain high standards of medical education, were of inestimable value in the deliberations of the Council.

INTERN HEALTH

Two years ago the Trustees asked of the Council on Medical Education and Hospitals that a study be made of the health of interns. Such a study was begun at once. A report of the preliminary steps of the investigation was presented to the House of Delegates a year ago. Briefly, there appeared no evidence to suggest that the health of interns was notably bad; yet among sixty-one interns who during the three year period of 1937, 1938 and 1939 were compelled to discontinue work because of illness, tuberculosis was an important and significant factor. This disease occurred in thirty-six instances and thus caused 59 per cent of all the serious casualties.

During the past year the problem of intern health has been further investigated from a different angle. Letters were sent to five thousand three hundred and one physicians who received their medical diplomas from recognized schools in 1937. They were asked to give an account of their hospital experience and also of the nature of any illness suffered during it, with a line stating the amount of time lost from work. This method of studying the problem was adopted in the belief that doctors in general might be interested in a study of this nature, and that, as a typical group, men and women four years out of medical school would remember their own illnesses with sufficient vividness as to make the data obtained both interesting and accurate.

Two thousand eight hundred and forty replies to the questionnaire have been received, and in addition are the records in the files of the American Medical Association of thirty-four fatalities known to have occurred among the men who graduated in that year.

Hospital life creates no immunity to illness. The types of illnesses to which these particular interns and residents fell heir make a glossary of diagnostic terms, though naturally respiratory infections were the commonest single incapacitator.

The illnesses, on the whole, were not incapacitating for long periods of time and proved to be of little more than a minor nuisance. There were three diseases which were encountered so frequently as to make them seem of significant importance. These were appendicitis, pneumonia and tuberculosis. There were 142 cases of appendicitis, there were 103 cases of pneumonia and there were 48 cases of tuberculosis.

In light of present knowledge, the illnesses which interns and residents are likely to acquire are not often strictly preventable. Interns and residents, however, should be given proper living quarters, adequate recreational facilities, good food, happy surroundings and some form of systematized medical supervision in order to protect their health reasonably and thus enable them to accomplish more. There should be enough interns in each hospital so that no one intern is grossly overworked. A friendly interest on the part of older members of the staff in the amount of work each intern does and in his physical and mental adjustments to it may do much to prevent catastrophes.

The problem of tuberculosis is important enough to receive particular consideration. Each hospital should make a rule to require chest roentgenograms of its interns at six month intervals. Large hospitals dealing with vast numbers of patients should go even further. They should require their interns and residents to have chest films at three month intervals. If a rule of this sort was made general, tuberculosis in the resident staff would be recognized more quickly than it is at present and unnecessary loss of the time spent in treatment would be saved.

On the whole, the health of doctors living in hospitals appears to be an important matter and it deserves careful consideration.

ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR CLINICAL LABORATORY TECHNICIANS

PREPARED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION WITH THE COOPERATION OF THE AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS

PREAMBLE

Two organizations are primarily concerned with the training of clinical laboratory technicians: the Council on Medical Education and Hospitals of the American Medical Association and the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists. The Council functions by inspecting, reporting and approving these schools, while the Board of Registry investigates and certifies the competence of the technicians.

The Council, with the cooperation of the Board of Registry, has promulgated standards for this type of training for the information of physicians, hospitals, prospective students and others and for the protection of the public.

Technicians are being trained in these schools to work under the direction of qualified physicians and not as independent practitioners of laboratory work.

I. ADMINISTRATION

1. Acceptable schools for training laboratory technicians may be conducted by general hospitals where the majority of the student's practical training is received. This arrangement should not discourage affiliations between the hospital and universities, colleges, public health laboratories or other hospitals.

2. Responsibility for the maintenance of the school should be placed on the hospital administrator rather than on the laboratory director.

3. Resources for continued operation of the school should be insured through regular budgets, gifts or endowments, but not entirely through students' fees. Experience has shown that commercial schools operated for profit frequently do not adhere to proper ethical and educational standards and therefore are not acceptable.

II. ORGANIZATION

1. Adequate space, light and modern equipment shall be provided in the laboratory department. A library containing up to date references, textbooks and scientific periodicals pertaining to clinical laboratory work and pathology should be maintained.

2. Satisfactory record systems shall be provided for all work carried on in the department. Monthly and annual classifications of the work of the department should be prepared.

3. Transcripts of high school and college credits and other credentials must be available. Records should be kept of each student's attendance and grades as well as the number and type of tests performed. In addition, a synopsis of the complete curriculum should be on file in the office of the laboratory director. This curriculum should include the rotation of assignments, the outline of instruction supplied by the laboratory and a list of the prepared specimens which are used to augment the experiences of the student.

4. At least two or more students should be enrolled in each class. Approval is automatically withdrawn if a school does not have any students for a period of two years, unless a satisfactory reason for this is given.

III. FACULTY

1. The school should have a competent teaching staff. The director must be a graduate in medicine who holds the certificate of the American Board of Pathology or who has had the equivalent in training and experience. He shall take part in and be responsible for the actual conduct of the training course. He shall be in daily attendance for sufficient time to supervise properly the laboratory work and teaching.

2. In laboratory practice the enrolment shall not exceed one student to each member of the teaching staff. The staff should include not less than one salaried instructor who is a registered technician or eligible for registration, in addition to the laboratory director. In order to be considered as an instructor, a

technician must have had three years of experience, while members of the hospital staff or visiting instructors must have regular assignments that cover a complete course prescribed in the Essentials.

IV. PREREQUISITES FOR ADMISSION

Candidates for admission should be able to satisfy one of the following requirements:

(*a*) Two years of college work, including chemistry and biology from an accredited college or university.

After Jan. 1, 1943 this requirement shall read two years of college work, including general chemistry, quantitative chemistry and biology from an accredited college or university. Bacteriology may be substituted for biology. Organic chemistry and physics are highly recommended.

(*b*) Graduation at a school of nursing recognized by the state board of nurse examiners and in addition college chemistry.

After Jan. 1, 1943 requirements for nurses shall include one year of college work, thirty semester hours (forty-five quarter hours), including courses in chemistry and biology.

V. CURRICULUM

1. The course of training shall be not less than twelve months in duration and shall include the following subjects: biochemistry, hematology, bacteriology, parasitology, histology and serology. The training shall also include a course in record keeping.

2. The instruction shall follow a planned outline similar to the Model Curriculum of the Board of Registry of Medical Technologists and shall be accomplished by text assignments, lectures or informal discussions, demonstrations, supervised practice, quizzes and written, oral and practical examinations.

VI. CLINICAL MATERIAL

Each student should receive practice training, adequate in kind and amount, under competent supervision, in a hospital laboratory. The hospital should be registered and be otherwise acceptable to the Council on Medical Education and Hospitals of the American Medical Association and have a minimum of two thousand yearly admissions. A sufficient amount of clinical material should be available to permit the student to comply with the requirements of the Board of Registry. If the hospital is not able to supply all of this material through its routine tests and examinations, artificial mediums should be provided.

VII. ETHICS

1. Exorbitant fees and commercial advertising shall be considered unethical.

2. Schools conducted primarily for the purpose of substituting students for paid technicians will not be considered for approval.

The report and the supplementary report of the Council were referred to the Reference Committee on Medical Education, with the exception of that part of the supplementary report dealing with intern health, which was referred to the Reference Committee on Hygiene and Public Health.

Report of Council on Scientific Assembly

Dr. James E. Paullin, Chairman, presented the report of the Council on Scientific Assembly as printed in the handbook, which was referred to the Reference Committee on Sections and Section Work.

Appointment of Reference Committee on Military Preparedness

On motion of Dr. Arthur J. Bedell, Section on Ophthalmology, seconded by Drs. Arthur T. McCormack, Kentucky, and Burt R. Shurly, Section on Laryngology, Otology and Rhinology, and carried, the House authorized the appointment of a Reference Committee on Military Preparedness, on which the Speaker named members as follows: Harvey B. Stone, Chairman; James E. Paullin; Sam E. Thompson; John H. O'Shea; Samuel J. Kopetzky; Edward H. Skinner, and Joseph F. Smith.

Address of Dr. T. C. Routley

The Chairman presented to the House Dr. T. C. Routley, official representative of the Canadian Medical Association, who addressed the House as follows:

Mr. Speaker, Mr. President, Mr. President-Elect, Ladies and Gentlemen: Once again it is my privilege and pleasure to bring you greetings from your brother practitioners in the Dominion of Canada. I do so on this occasion not only for those who are with us in Canada but on behalf of perhaps fifteen hundred who are no longer within our borders but are serving in forces in other lands.

Since I had the privilege of speaking to you a year ago, we have seen the world become turbulent and confused. These are days, however, when at least one profession may be expected to endeavor to keep the world on an even keel. The medical profession as a scientific body marches on; it recognizes no geographic or international boundaries; it is a profession to which mankind can look and should look for leadership and guidance and sane living. It is my hope that the medical profession of all lands will find its true place in the days to come.

I would like, sir, to express on behalf of my organization our profound thanks for the presence at our annual meeting last year of Dr. Van Etten and Dr. Cullen, who came to us, who brought us greetings, and who added materially to the success of our meeting.

I should also like to express in anticipation of his coming a most cordial welcome to Dr. Braasch, who is to visit us on your behalf at the Winnipeg meeting, and may I say to those of you who find it convenient to be in Winnipeg during the last week of June, we shall open to you our hearts and our homes and make you as welcome as you have made me for these many years.

Mr. Chairman, I shall not detain you longer other than to say a final word. I want to thank you from the bottom of my heart, and I speak for all Canadians when I say this, because we know you are our good neighbor.

NEW BUSINESS

Resolution Requesting the Appointment of a Committee to Survey the Relationship of Medicine and Law

Dr. Walter G. Phippen, Massachusetts, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, Medical knowledge and skills have much to offer in investigations which seek to determine the cause of and the circumstances surrounding certain deaths; and

WHEREAS, The quasijudicial office of county coroner does not possess and is not qualified to exercise such knowledge and skills; and

WHEREAS, The failure to utilize such knowledge and skills seriously impairs the ends of justice; and

WHEREAS, The utilization of such knowledge and skills is essential to the public good; and

WHEREAS, The commonwealth of Massachusetts was the first community in the English speaking part of this continent to discard the archaic county coroner and substitute a system of county medical examiners; and

WHEREAS, The Massachusetts Medical Society was largely instrumental in bringing this about; be it therefore

Resolved, That (1) the Speaker of the House of Delegates of the American Medical Association shall appoint a committee of three, which committee shall be designated as this House of Delegates shall determine; (2) the committee so appointed shall survey the relationship of medicine and the law with particular reference to the manner in which this relationship is exercised in those counties which still cling to the coroner system; (3) the committee set up under this resolution shall be instructed to confer with such other committee or committees as are or will be designated by the American Bar Association, and (4) the committee created by this resolution shall make available to state medical societies all information gathered under these instructions.

Resolution Authorizing Establishment of a Health Exhibit for the Public at Cities Where Annual Sessions Are Held

Dr. William R. Molony Sr., California, presented the following resolution, which was referred to the Board of Trustees:

WHEREAS, The California Medical Association, recognizing the need of acquainting the general public with the problems of health and sound principles of medical practice, has established a policy of public health education; and

WHEREAS, Scientific exhibits constitute an effective means of acquainting the public with health problems as evidenced by the great public interest in the week-long Health Defense Exhibit in the Shrine Auditorium sponsored by the Los Angeles County Medical Association; and

WHEREAS, Such material is easily available at the time in each city in which the American Medical Association meeting is held and public interest has already been aroused by favorable newspaper publicity in relation to said convention; therefore be it

Resolved, That this House of Delegates of the American Medical Association authorize the Board of Trustees in its judgment to establish during the week immediately following the session a health exhibit for the public in each of the various cities in which the annual session of the American Medical Association is held and utilize such material from the Scientific Exhibit, to which other material may be added, which would be of interest and of educational value to the general public.

Proposed Amendment to By-Laws

Dr. O. P. J. Falk, Section on Pharmacology and Therapeutics, presented the following proposed amendment to the By-Laws, which was referred to the Reference Committee on Amendments to the Constitution and By-Laws:

The Council on Scientific Assembly at its meeting held in Chicago last December endorsed the proposal that the name of the Section on Pharmacology and Therapeutics be changed to the Section on Experimental Medicine and Therapeutics. This recommendation has been included in the report of the Council on Scientific Assembly made to the House of Delegates at this session.

The Section on Pharmacology and Therapeutics therefore requests that chapter XV, section 1 be amended so that item 7 in that section shall read "7. Experimental Medicine and Therapeutics."

Resolution Requesting Appointment of Committee to Study Question of Determination of Serum Sensitivity

Dr. Walter W. Mott, New York, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, On the occasion of a train wreck at Little Falls, N. Y., in April 1940 a number of the injured were brought in unconscious; and

WHEREAS, In making tests to determine serum sensitivity before administering tetanus antitoxin 2 cases were found; and

WHEREAS, It has been suggested that a tattoo code or other means of identification showing serum sensitivity might be devised to safeguard unconscious accident patients; and

WHEREAS, The Medical Society of the State of New York considers the subject deserving of national consideration; therefore be it

Resolved, That a committee of the American Medical Association study this question and report to this House in 1942.

Resolution Requesting Appointment of Committee to Confer with Specialty Boards

Dr. L. G. Christian, Michigan, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

Report of the Committee on Distribution of Medical Care Presented to the Michigan State Medical Society House of Delegates, Sept. 24, 1940:

Arising out of the discussion of the report of the committee on distribution of medical care, the following points seem clear:

1. It is recognized that not all qualified physicians have been certified by a specialty board.

2. It is also recognized that the opportunities for formal academic preparation for certification by these boards are very limited, and, further, that the value of experience has not always been given adequate consideration.

To correct the above mentioned faults in the existing situation, the reference committee offers the following resolution, which was adopted by the house of delegates of the Michigan State Medical Society:

WHEREAS, Now as never before, this country needs the concerted effort and wholehearted cooperation of American physicians; and

WHEREAS, Certification by specialty boards is being arbitrarily taken by government agencies as an imperative requirement for performance of many medical services paid for by government funds; and

WHEREAS, Such work is increasing in amount and importance; and

WHEREAS, This policy works a hardship on many qualified physicians by excluding them from such work; therefore be it

Resolved, That the Michigan delegates to the American Medical Association be instructed to propose to the House of Delegates of the American Medical Association that a committee of that House be created to confer with specialty boards, national organizations of specialists and government agencies to effect some equitable adjustment of these difficulties and remove this potential source of dissension in the ranks of American medicine.

Resolution on Eligibility of Women Physicians and Surgeons for Medical Reserve Corps

Dr. Emily D. Barringer, New York, presented the following resolution, which was referred to the Reference Committee on Military Preparedness:

WHEREAS, The United States of America is at present engaged in a vast preparedness program which includes a listing of members in the Medical Reserve Corps available for active service; and

WHEREAS, There are approximately eight thousand women physicians and surgeons in the United States, and women physicians and surgeons of America demonstrated their fitness for wartime service during the first World War when they financed units and staffed hospitals with well trained officers, in France and Serbia; and

WHEREAS, The United States government has to date taken no cognizance of these women physicians in time of national emergency; and

WHEREAS, The government has already granted women nurses Army rating with proper rank, pay, and war risk insurance; and

WHEREAS, The Medical Society of the State of New York has gone on record recommending that the women physicians and surgeons of America be made eligible for the Medical Reserve Corps of the United States Army and Navy and be granted full privileges thereof; therefore be it

Resolved, That the American Medical Association go on record to this effect and that a request go to the Surgeon Generals of the Army and Navy to make women physicians and surgeons of the United States eligible for the Medical Reserve Corps of Army and Navy with full privileges thereof.

Resolutions on Specialists

Dr. Thomas A. McGoldrick, New York, presented the following resolutions, which were referred to the Reference Committee on Medical Education:

WHEREAS, At the regular meeting of the Kings County Medical Society held March 19, 1940 the following resolution was introduced and passed unanimously; be it

Resolved, That in order to serve better the hospitals with which they are connected and to improve that service by greater cooperation and understanding, the Joint Council of Pathologists, Radiologists, Anesthesiologists and Physical Therapy Physicians recommends that all hospitals approved for medical training for interns shall have physicians especially trained in pathology, radiology, anesthesiology and physical medicine in charge of these respective departments and that the directors of these departments shall be members of their respective medical boards or their equivalent, with voice and vote; and

WHEREAS, At the meeting of the Kings County Medical Society the delegates to the Medical Society of the State of New York were instructed to present and support the foregoing resolution; therefore be it

Resolved, That in those communities in which the aforementioned specialties are not represented by specialists it shall be permissible for physicians trained in these specialties to represent the specialty on their respective medical boards or their equivalents; and be it

Resolved, That the house of delegates of the Medical Society of the State of New York at its regular session of May 6, 1940 does hereby approve this resolution; and be it further

Resolved, That this resolution be presented to the House of Delegates of the American Medical Association at its next meeting in New York City, in June 1940.

Resolutions Requesting Appointment of Committee to Confer with Committees of Hospital Associations

Dr. Harry H. Wilson, California, presented the following resolutions, which were referred to the Reference Committee on Legislation and Public Relations:

WHEREAS, In the drafting of policies or contracts to cover medical and hospitalization services of nonprofit and other prepayment organizations it is of primary importance that the agreements or contracts shall make a clear differentiation of medical and hospitalization services that will permit physicians who give pathologic laboratory, x-ray laboratory, anesthesia or similar services, to maintain their physician-patient relationship and their own status as physician specialists; and

WHEREAS, In many plans designed to promote more adequate service among lower income groups of citizens it has seemingly been difficult to maintain the necessary professional distinctions concerning such medical work, and the ways and means whereby compensation shall be made therefor; now therefore be it

Resolved, That the California Medical Association through its constituted authorities herewith requests the House of Delegates of the American Medical Association to instruct the Board of Trustees of the American Medical Association to appoint a committee of such number as may be deemed advisable to confer with similar committees representing the American Hospital Association and the Catholic Hospital Association of the United States, the conjoint committees to study and submit reports to their respective national bodies, in which would be outlined platforms or principles designed to clarify the relation of medical services that may be offered in prepayment hospitalization and similar plans, the same to be in line with the basic principles laid down in the past by the House of Delegates and other authorities of the American Medical Association; and be it further

Resolved, That the Board of Trustees be requested to proceed in these matters as expeditiously as may be possible, and to submit the com-

mittee's report, with such suggestions and/or recommendation that the Board of Trustees may wish to attach thereto, at the next annual session of the American Medical Association, the Board of Trustees to be authorized in the interim to advise the constituent state associations of the American Medical Association concerning tentative or other agreements that may have been reached.

Resolution Requesting the Creation of a Section on General Practice

Dr. Henry A. Luce, Michigan, presented the following resolution, which was referred to the Reference Committee on Sections and Section Work:

WHEREAS, Sixty-six and two-thirds per cent of the doctors of medicine of this nation are general practitioners, and these general practitioners constitute the bulk of the membership of the American Medical Association; and

WHEREAS, General practice is an entity of and by itself within the profession, is definite in its comprehension and is limitless in its extension; and

WHEREAS, The organized specialty groups have set up certain restrictive rules and regulations concerning important portions of the field of general practice, which rules and regulations cannot be met and surmounted in the aggregate by the physicians who are making general practice their life work; and

WHEREAS, Forty per cent of surgery and 50 per cent of obstetrics are efficiently performed by well trained general practitioners; and

WHEREAS, Efforts to date looking toward the creation of an official section of general practitioners in the American Medical Association have met with disapproval and no sufficiently good reasons have been advanced for denying the general practitioners this vital means by which they can help themselves to face and solve their own particular problems; and

WHEREAS, General practitioners are constantly engaged in continuation study to increase their proficiency along practical lines and are developing more suitable programs of clinical study, as is evidenced by statistics from one section of the country which shows that 60 per cent of those in attendance at postgraduate courses are general practitioners; and

WHEREAS, No place has been provided on hospital staffs through which general practitioners would be enabled to submit their evidence of special training in certain fields of medicine and surgery which would qualify them before the public as proficient therein; and

WHEREAS, General practitioners have a special interest in medical legislation, administration and jurisprudence which justifies their particular voice being officially heard; and

WHEREAS, It is not the desire of the general practitioner to disrupt the splendid variety and caliber of scientific programs of the American Medical Association but rather to create a new and proper basis for separate registration, representation and participation in the general activities of the organization; and

WHEREAS, The general practitioners have original contact with the great majority of all patients; and

WHEREAS, The people of the United States will be inclined to view with favor and good will the official recognition of their family physicians as a distinct part of the American Medical Association; and

WHEREAS, The specialty fields are overcrowded with general practitioners classified as specialists only because there is no proper classification for them; and

WHEREAS, The establishment of an official Section on General Practice in the American Medical Association will stimulate a more active interest and cooperative attitude among the profession generally, making for greater unity in the advancement of the organization's programs; and

WHEREAS, The Council of the Wayne County (Mich.) Medical Society has gone on record as endorsing the introduction of this resolution for the creation of a Section on General Practice of the American Medical Association; and

WHEREAS, The Michigan State Medical Society has approved the introduction of resolutions at this meeting looking toward the expansion of hospital staff privileges for general practitioners throughout the country; therefore be it

Resolved, That the House of Delegates of the American Medical Association take whatever action is proper at this time to create as soon as possible a new Section on General Practice to be duly constituted of equal rank and authority with the other sections already established.

Resolution on Hospital Privileges for General Practitioners

Dr. C. R. Keyport, Michigan, presented a resolution dealing with hospital privileges for general practitioners, which was referred to the Reference Committee on Miscellaneous Business.

Resolution on Continuation of Supply of Well Trained Medical Graduates

Dr. Louis H. Bauer, New York, presented a resolution concerning the deferment of medical students, which was read by title and referred to the Reference Committee on Military Preparedness.

Communication Concerning Uncompensated Services Rendered by Physicians to the Selective Service

Dr. Edward E. Barlow, Arkansas, presented by title a communication concerning uncompensated services rendered by physicians to the Selective Service, which was referred to the Reference Committee on Military Preparedness.

Resolution on Medical Examination of Draftees

Dr. T. K. Gruber, Michigan, presented by title a resolution on Medical Examination of Draftees, which was referred to the Reference Committee on Military Preparedness.

Resolution on Patriotic Services of Native American and Foreign Born Physicians

Dr. Samuel J. Kopetzky, New York, presented by title a resolution dealing with patriotic services of native born and foreign born physicians, which was referred to the Reference Committee on Military Preparedness.

The House recessed at 12:45 p. m. to reconvene at 9:30 a. m., Tuesday, June 3.

(To be continued)

REGISTRATION AT CLEVELAND

The total registration at Cleveland was 7,269. Below are summaries of the registration by sections and by states:

Registration by Sections

Practice of Medicine	2,440
Surgery, General and Abdominal	1,147
Obstetrics and Gynecology	432
Ophthalmology	281
Laryngology, Otology and Rhinology	257
Pediatrics	277
Pharmacology and Therapeutics	55
Pathology and Physiology	315
Nervous and Mental Diseases	182
Dermatology and Syphilology	191
Preventive and Industrial Medicine and Public Health	187
Urology	195
Orthopedic Surgery	225
Gastro-Enterology and Proctology	243
Radiology	236
Anesthesiology	137
Two or more sections or no sections marked	458
Miscellaneous Topics	21
Total	7,269

Registration by States

Alabama	33	Nevada	2
Arizona	17	New Hampshire	13
Arkansas	19	New Jersey	94
California	204	New Mexico	2
Colorado	49	New York	713
Connecticut	59	North Carolina	46
Delaware	12	North Dakota	7
District of Columbia	91	Ohio	2,372
Florida	57	Oklahoma	37
Georgia	42	Oregon	24
Idaho	5	Pennsylvania	646
Illinois	568	Rhode Island	18
Indiana	217	South Carolina	25
Iowa	73	South Dakota	3
Kansas	47	Tennessee	59
Kentucky	87	Texas	106
Louisiana	46	Utah	17
Maine	19	Vermont	8
Maryland	73	Virginia	66
Massachusetts	149	Washington	35
Michigan	442	West Virginia	97
Minnesota	117	Wisconsin	130
Mississippi	14	Wyoming	2
Missouri	149	Canada	35
Montana	12	Miscellaneous	44
Nebraska	67	Total	7,269

MEDICAL LEGISLATION

STATE MEDICAL LEGISLATION

Florida

Bills Introduced.—H. 1626 proposes to establish in Dade County the office of county medical examiner. The county medical examiner must be a graduate of some recognized school of medicine and surgery and licensed to practice in the state. It is proposed to confer on the county medical examiner the authority and duties generally conferred in other states on coroners. H. 1636 proposes to establish the office of county medical examiner in all counties having a population of more than 267,000. The jurisdiction proposed to be conferred on the county medical examiner in such counties is similar to the jurisdiction proposed in H. 1626.

Bill Passed.—H. 1556 passed the House, May 27, proposing to establish a public hospital district in Broward County to provide free of cost necessary hospital care and medical treatment to indigent residents of the county. Such care and treatment may be rendered to persons who are not paupers for a reasonable compensation for occupancy, nursing, care, medicine and attendance, according to the rules and regulations to be prescribed by the board of trustees of the hospital district.

Illinois

Bills Introduced.—S. 641 proposes to prohibit the retail sale and distribution of barbital except on the written prescription of a licensed physician, dentist or veterinarian. The bill states that "'Barbital' includes diethyl-barbituric acid, barbital sodium, and all compounds containing barbital, barbituric acid, barbital sodium, or any derivative of any of them, whether in crystalline, liquid, or other form, which are, or may be used internally as painkillers, soporifics, or for other purposes." H. 910 proposes to authorize the Department of Public Health, through its Division of Cancer Control, to formulate policies, establish standards and regulations, prescribe schedules and terms of payment, and specify the conditions under which indigent cancer patients may be provided with care and treatment at governmental expense. The bill proposes to authorize the department to acquire such equipment and other materials and to hire such personnel as may be necessary to carry out the purpose of the bill. The bill proposes to appropriate $200,000 to the department for these purposes. H. 911 proposes to create a Committee to Investigate Chronic Diseases among indigents to make a thorough survey of the number of persons in indigent circumstances in the state afflicted with chronic diseases who are not already provided for in existing state institutions and to submit recommendations to the sixty-third general assembly, when it convenes, accompanying the recommendations with appropriate legislative proposals to provide for the construction, equipment and operation of such institution or institutions as the committee may determine to be necessary.

DISTRICT OF COLUMBIA

Bill Introduced.—S. 1593, introduced by Senator McCarran, Nevada, provides that certain buildings and grounds of hospitals in the District of Columbia and occupied and used by the hospitals for legitimate hospital purposes shall be exempt from all national and municipal taxation.

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 4926 has passed the House, making appropriations for the Department of Labor, the Federal Security Agency and related independent agencies, for the fiscal year ending June 30, 1942. This bill, among other things, authorizes an appropriation of $1,235,000 to enable the United States Public Health Service to assist state and local health authorities in health and sanitation activities (1) in areas adjoining military and naval reservations, (2) in areas where there are concentrations of military and naval forces, (3) in areas adjoining government and private industrial plants engaged in defense work and (4) in private industrial plants engaged in defense work. This appropriation, too, may be utilized to provide emergency health and sanitation services in government industrial plants engaged in defense work and in areas adjoining United States military and naval reservations outside of the United States. The bill furthermore appropriates $1,200,000 to be utilized by the United States Public Health Service for the cost, including subsistence but not cash allowances to trainees, of refresher, student nurse and postgraduate nursing courses, including courses in midwifery. H. R. 4965 has been passed by the House, making appropriations for the military establishment for the fiscal year ending June 30, 1942. As reported, this bill provided, among other things, for an appropriation for the employment of interns at not to exceed $720 per annum each. On the floor of the House an amendment was adopted providing for the employment of interns, at $720 per annum, who are graduates or have successfully completed at least four years' professional training in reputable schools of medicine or osteopathy. Another amendment appropriates "such additional sum as the Surgeon General [of the army] may determine to be necessary for assisting financially civilian schools on account of student nurses undergoing training therein for duty in army hospitals and for assisting such student nurses."

Bill Introduced.—S. 1546, introduced by Senator McNary, Oregon, relates to the production of poppies for seed purposes only. This bill provides that no person who produces opium poppies shall, by reason of the production of such poppies, be deemed for the purposes of any Act of Congress to be a producer of opium or any derivatives thereof, or of any other narcotic substance, if he complies with the regulations prescribed by the Secretary of Agriculture. The bill provides that the Secretary of Agriculture shall prescribe regulations (1) providing that any person who seeds land to opium poppies shall file with the Secretary, or his representative, at such time or times as may be fixed by such regulations, a report or reports showing the area and location of the land seeded by him to such poppies; (2) prohibiting the collection or extraction from such poppies of any opium, morphine or other narcotic substance; (3) providing for such utilization and disposition of every part of the poppy plants by the producer of any such poppies in such manner as will, in the opinion of the Secretary, prevent the extraction or collection of narcotic substances therefrom, and (4) providing that the producer of any such poppies shall make such reports, under oath, with respect to the utilization and disposition of every part of the poppy plants as may be required by the Secretary.

WOMAN'S AUXILIARY

Indiana

On February 3 and 4 the regional meeting of the Women's Field Army for Cancer Control met in Indianapolis with the national auxiliary president, Mrs. V. E. Holcombe, of Charleston, W. Va., present. Accompanying her was Mrs. A. A. Seletz, also of Charleston, and the program chairman for the West Virginia state auxiliary. A luncheon in their honor was given February 3 in the Indianapolis Athletic Club.

The Woman's Auxiliary to the Indiana State Association has added a new group to its organization, La Porte County. This new auxiliary chose Mrs. F. M. Fargher, of Michigan City, as president.

The legislative committee provided the program for the Marion County auxiliary, January 6. Dr. Norman Beatty and Mr. Thomas A. Hendricks discussed medical legislation pending in the state legislature. Fifty-one members attended the meeting.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Orchestral Society.—Physicians and dentists have joined in organizing the Medical Arts Orchestral Society in Los Angeles. William R. Bergren of the California Institute of Technology, Pasadena, is the conductor, and rehearsals take place every Thursday night in the auditorium of the Cedars of Lebanon Hospital. Interested persons are requested to communicate with Dr. Fred Lindenberg, secretary of the society.

Santa Monica Hospital Transferred.—The Santa Monica Hospital, Santa Monica, will be turned over to the California Hospital, operated by the Lutheran Hospital Society of Southern California, Los Angeles, Jan. 1, 1942. The transfer will fulfil the plans of Dr. William S. Mortensen, president and medical superintendent of the Santa Monica Hospital, to convert his profit corporation into a nonprofit charitable institution for the citizens of Santa Monica. The gift includes the one hundred and fifty bed Santa Monica Hospital and adjoining property and the Loamshire Convalescent Home, with a capacity of thirty beds, and will serve to create a memorial to Dr. August B. Hromadka and Dr. Mortensen. The widow of Dr. Hromadka is participating in the transaction. The administration of the Santa Monica Hospital, which will be converted into a two hundred bed institution, will be carried out under a foundation, the creation of which is now being negotiated. The present medical staff will continue and the two hundred workers at the hospital will be retained.

CONNECTICUT

Yale Dedicates New Library Building.—The dedication and opening of the new Yale Medical Library, New Haven, will take place June 15. The ceremony will open with an introduction by Wilmarth S. Lewis, chairman, the Yale Corporation's Committee on the Library and Museum. A feature will be the presentation of a gift for the rotunda from the class of 1891 in memory of Dr. Harvey Cushing, New Haven. Starling W. Childs, a member of the class, will make the presentation and Charles Seymour, LL.D., president of the university, will accept the gift for the university and Dr. Francis G. Blake, dean, for the school of medicine. Dr. John Homans, clinical professor of surgery, Harvard Medical School, Boston, will give the address and Rev. George Stewart, minister of the First Presbyterian Church, Stamford, will deliver the benediction. The new building was made possible through an appropriation of $600,000 from the estate of John W. Sterling, who graduated at Yale in 1864. It is located on the grounds of the Yale University School of Medicine and is designed as an extension to the library wing of the Sterling Hall of Medicine. The building is Y-shaped and combines facilities for studies based on the history of medicine and the medical sciences with those for more strictly professional study for the practice of medicine and the prosecution of medical research. The Historical Library, of which the nucleus is the recently acquired Cushing collection, is in one branch of the Y and the General Medical Library in the other, with separate reading rooms for each. The Beaumont Room, in which will be displayed items from the Beaumont Collection, will be located centrally on the second floor. This room will also serve for lectures, seminars and meetings. The building will provide offices and studies. With its stack rooms and bookshelves on all floors it will be capable of housing upward of 400,000 volumes, providing space to meet future growth. There is also provision for a well equipped photographic laboratory and for storage of films.

ILLINOIS

Society News.—Dr. Willard C. Scrivner, East St. Louis, discussed "Management of Placenta Praevia and Premature Detachment of the Placenta" before the Madison County Medical Society in Collinsville, April 4.——Dr. Clinton W. Lane, St. Louis, discussed "Contact Dermatitis" before the Peoria Medical Society, April 15.——The Sangamon County Medical Society was addressed in Springfield, May 1, by Drs. Millard F. Arbuckle and Brian B. Blades, both of St. Louis, on "Lung Abscess from the Standpoint of the Bronchoscopist" and "Pulmonary Resection" respectively.——Dr. William Thompson, St. Louis, discussed "Management of Acute Abdominal Emergencies" before the Adams County Medical Society, Quincy, April 14.——Dr. Charles E. Galloway, Evanston, discussed "Pathology of the Cervix" before the Rock Island County Medical Society, May 13, in East Moline.

Zoologist Joins Illinois Staff.—Carl G. Hartman, Ph.D., research associate in embryology of the Carnegie Institution of Washington, Johns Hopkins University School of Medicine, Baltimore, has been appointed professor of zoology and head of the departments of zoology and physiology at the University of Illinois, Urbana, effective September 1. *Science* reports that a consolidation of the two departments is anticipated. Victor E. Shelford, Ph.D., professor of zoology at Illinois, will continue his research with a reduced teaching load, it was stated. Dr. Hartman received his degree of doctor of philosophy at the University of Texas in 1915.

Chicago

Branch Societies.—Dr. George H. Gardner discussed "Differential Diagnosis and Management of Leukorrhea" before the Northwest Branch of the Chicago Medical Society, April 18, and Dr. Chauncey C. Maher, "Management of Cardiac Edema." Dr. Cleveland J. White addressed the Calumet Branch, April 18, on "Common Skin Disorders and Their Modern Management." Among others, Drs. LeRoy H. Sloan and Chester C. Guy addressed the Jackson Park Branch, April 17, on "Spinal Cord Tumor" and "A Common Error in Diagnosis of Appendicitis in Women." Dr. Willard O. Thompson discussed "Sex Hormones: Clinical Application" before the West Side Branch, April 17. The Stock Yards Branch was addressed, April 17, by Drs. Ben Z. Rappaport on "Allergy in Infants and Children" and Francis E. Senear, "Common Skin Disorders in Infants and Children." Dr. Adolph Hartung addressed the North Shore Branch, May 6, on "Abdominal Tumors of Questionable Origin" and Drs. Jay M. Garner, Winnetka, and Jerrold P. Nesselrod, Evanston, "Cinematographic Proctoscopy in Color."

New Publication Committee.—The president of the University of Chicago has appointed five members of the faculty to a committee on biology and medicine to further the publication through the University Press of books in the field of medicine and the biologic sciences. Members of the committee are William H. Taliaferro, Ph.D., dean of the Division of Biological Sciences and chairman of the department of bacteriology and parasitology and Eliakim H. Moore distinguished service professor of parasitology; Drs. Franklin C. McLean, professor of pathologic physiology; Charles Phillip Miller, associate professor of medicine; Lester R. Dragstedt, professor of surgery, and Thomas Park, Ph.D., assistant professor of zoology. The committee will advise the University of Chicago Press of research suitable for publication, will plan needed texts and will act as a possible outlet for valuable work now being done throughout the country in the biologic and medical fields. In the matter of securing manuscripts, the committee will be assisted by an advisory group, one man from each department of the biologic sciences at the university. Appointments to the newly formed committee are for five years. It replaces the committee on medical monographs.

INDIANA

First Year of Premarital Examinations.—A report on the first full year of operation of Indiana's premarital blood test law showed that positive results were obtained in tests for syphilis in 1.6 per cent of marriage license applicants, newspapers reported April 18. In the twelve months dating from March 1, 1940, when the law became effective, 64,913 tests were made; of these 1,098 showed positive syphilis reactions. The report shows that 31,038 tests were made on pregnant women with 450 having positive reactions. In the United States Army selective service group from Indiana 33,017 serologic tests were made and 321, or 3.8 per cent, showed positive reactions, newspapers stated.

District Meetings.—Physicians of the Sixth Councilor District met in New Castle, May 16, to hear, among others, Lieut. Col. Irving H. Willett, Fort Wayne, discuss "The Army Medical Service and the Doctor."——At a meeting of the Ninth Councilor District Medical Society in Frankfort, May 22, Dr. Arthur F. Weyerbacher, Indianapolis, addressed the banquet session on "Romance and Venereal Disease."—— Speakers before the Tenth Councilor District Medical Society in Gary, May 14, included Dr. Samuel Feinberg, Chicago, on "Allergy of the Nose."—— The Eleventh Councilor District Medical Society was addressed in Kokomo, May 21, among others, by Dr. William R. Cubbins, Chicago, on "Chest Injuries, Abdominal Injuries and Fractures of the Extremities."

IOWA

Twin Lakes District Meeting.—The eighteenth annual assembly and dry diagnostic clinic of the Twin Lakes District Medical Society will be held at Rockwell City June 19, under the presidency of Dr. John R. Christensen, Eagle Grove. Dr. Roy W. Fouts, Omaha, will open the program with a talk on the "Art of Medicine." The following will conduct clinics:

Dr. Charles C. Dennie, Kansas City, Mo.
Dr. Archibald Ross McIntyre, Omaha.
Dr. Gordon B. New, Rochester, Minn.
Dr. Waltman Walters, Rochester.
Dr. George E. Fahr, Minneapolis.

Dr. Carl M. Peterson, Secretary, Council on Industrial Health, American Medical Association, Chicago, will conclude the day's program with an address entitled "The Private Practitioner and Industrial Preparedness."

KENTUCKY

Donates Library for Negro Physicians.—Dr. August Schachner, Louisville, has given a collection of 1,000 medical volumes for the use of Negro physicians. The library is housed in the Western Colored Library under the care of the Louisville Free Public Library in a special Schachner Memorial Room. Dr. Schachner, now 80 years old, made the presentation, and addresses were made by Drs. Rettig Arnold Griswold, professor of surgery, University of Louisville School of Medicine; Orville L. Ballard, Waverly Hills, secretary of the Falls City Medical Association, and Coleman Milton Young Jr., director of the Central Louisville Health Center, among others. Letters were read from Drs. Arthur T. McCormack, secretary of the Kentucky State Medical Association, and Irvin Abell, former president of the American Medical Association, both of Louisville.

MAINE

State Medical Meeting.—The eighty-ninth annual session of the Maine Medical Association will be held at the Marshall House, York Harbor, June 22-24, under the presidency of Dr. Thomas A. Foster, Portland. The scientific program has been divided into conferences covering the following topics: traumatic surgery, cardiac lesions, obstetrics, otolaryngologic pediatrics and surgery. A symposium on vascular and arterial diseases will be presented by Drs. Laurence B. Ellis, Burton E. Hamilton and Reginald H. Smithwick, all of Boston. There will also be a symposium on problem fractures. Among the speakers on the program will be:

J. Ernestine Becker, D.Sc., specialist in nutrition, Children's Bureau, U. S. Department of Labor, Washington, D. C., The Vitamins, What They Are, What They Do for You, and Where You Get Them.
Dr. John F. Holmes, Manchester, N. H., A Study of the Slipping Rib Cartilage Syndrome.
Dr. Henry B. Elkind, Boston, Practical Aspects of the Modern Mental Hygiene Movement.
Dr. William Dameshek, Boston, The Spleen: Facts and Fancies.
Dr. Arthur W. Allen, Boston, Gastric Ulcer and Its Relationship to Cancer.

At the dinner Monday evening "fifty year" medals will be presented to the following: Drs. Lindley Dobson, Presque Isle; Willey Edgar Sincock, Caribou; William H. Bradford, Portland; George A. Gregory, Boothbay Harbor; Nathaniel H. Crosby, Milo, and Ernest A. White, Columbia Falls. The annual dinner Tuesday evening will be addressed by Gov. Sumner Sewall and Dr. Frank H. Lahey, Boston, President of the American Medical Association.

MINNESOTA

Osteopath's Eight Year Sentence Upheld.—On April 10, 1941 the Supreme Court of Minnesota upheld the sentence of not to exceed eight years at hard labor imposed by Judge Kenneth G. Brill of the Ramsey County District Court on May 13, 1940 on Samuel M. Stern, St. Paul osteopath, under the state habitual criminal act. Stern pleaded guilty to an information charging him with the crime of abortion. The prior offense alleged, which resulted in the double sentence authorized under the habitual criminal act, was Stern's conviction of embezzlement Jan. 3, 1922 by a jury in Orange County, Calif. He served one year in the San Quentin prison and was then paroled. In September 1938 he obtained a pardon from former Governor Merriam of California "in order to restore his citizenship." Stern claimed in the present case that having been pardoned by the governor of California he could not be given a double sentence by Judge Brill in the abortion case. However, the supreme court of Minnesota upheld Judge Brill and pointed out that the legislature had not excepted pardoned prior criminal offenses from the habitual criminal law of this state and, therefore, Stern was properly sentenced by Judge Brill to a term of not to exceed eight years at hard labor.

MONTANA

State Medical Meeting in Great Falls.—The Medical Association of Montana will hold its sixty-third annual session in Great Falls June 23-25, under the presidency of Dr. James I. Wernham, Billings. The preliminary program lists the following speakers:

Dr. Emile F. Holman, Carcinoma of the Lung—Its Early Diagnosis and Treatment; Carcinoma of the Stomach—Its Early Diagnosis and Treatment by Aseptic Resection of the Stomach.
Dr. Donald E. King, Fracture of the Spine—Its Treatment and Complications; Fracture of the Upper Extremity.
Dr. Charles W. Barnett, Massive Dose Arsenotherapy in the Treatment of Syphilis; Prognosis and Treatment of Late Syphilis of the Cardiovascular System.
Dr. Davis A. Rytand, Management of Hypertension; Interpretation of the Newer Laboratory Methods.
Dr. Maurice L. Tainter, Chemotherapy, Including the Sulfanilamide Group; Practical Applications of the Sympathetic Drugs, Including Benzedrine.

Dr. Tainter will address the banquet Tuesday evening. All are members of the faculty of Stanford University School of Medicine, San Francisco. Sessions will be held by the Montana Academy of Oto-Ophthalmology, June 22-23, and the Montana Public Health Association, June 26-27.

NEW MEXICO

Health in New Mexico.—The biennial report of the state department of public health, covering 1939-1940, shows that tuberculosis continues to be a major problem. From one half to two thirds of the cases originate outside the state, but it is said that tuberculosis among the native born is increasing as a result of their contact with health seekers. With the highest infant mortality rate in the United States reported for New Mexico, the health department has emphasized this subject, pointing out the 109 centers for maternal and child health clinics or conferences as community projects. Special instruction and supervision has been given to midwives and postgraduate instruction provided for physicians and nurses. In San Miguel County a demonstration unit has been established with funds provided by the Social Security Act. A nutrition program was started in January 1940 with federal funds, and a state nutrition council has been formed. Typhoid has declined since 1935; in 1940 there were 142 fewer cases than the average for the five preceding years. In 1935 there were 436 cases with 47 deaths. A pneumonia control program was operated from January to June 1940, during which time serum and sulfapyridine were provided without cost to patients unable to pay for them. A cancer control program, largely educational, was started at the beginning of the present fiscal year. In 1939 the state had 107 cases of poliomyelitis, the largest number reported during the past ten years. Selective service examinations taxed the public health laboratory from November through December 1940 with serologic tests for the diagnosis of syphilis; 2,210 specimens were examined, of which 95 gave evidence indicative of infection. An epidemic of rabies among dogs and other animals has been prevalent in the two years, the report says; in 1940 there was one human death from rabies. Demands for birth certificates as a result of the national defense effort placed a heavy burden on the division of vital statistics. A table showing major causes of death for 1939 gave the following rates per hundred thousand of population: heart disease 125.3, influenza and pneumonia 116.6, accidents 97.6, congenital malformations and diseases of infancy 81.8, tuberculosis 81.2, cancer 60.8, diarrhea and dysentery 58.9, nephritis 49.3, cerebral hemorrhage 47.3 and puerperal causes 15.2.

NEW YORK

Meeting of School Physicians.—The New York State Association of School Physicians will hold its annual meeting and conference at the Grand Union Hotel, Saratoga Springs, June 23. A program has been arranged of interest to school physicians, health officers and general practitioners.

Hospital News.—New York Hospital-Westchester Division, White Plains, opened a new building for acutely ill women patients in March. The building, which has space for twenty beds, is called the Nichols Memorial Cottage in memory of Dr. Charles H. Nichols, superintendent of the hospital from 1877 to his death in 1889.

Cornerstone Laid for Science Building.—The cornerstone of the new Edward Bausch Hall of Science and History, the gift of Edward and Matilda Bausch to the Rochester Museum of Arts and Sciences, was laid recently. Robert A. Millikan, Ph.D., director of the Norman Bridge Laboratory of Physics and chairman of the executive council, California Institute of Technology, Pasadena, was the principal speaker.

Health Officers' Conference.—The annual Conference of Health Officers and Public Health Nurses will be held at Saratoga Springs, June 24-26. The provisional program announces the following speakers, among others:

Dr. Soma Weiss, Boston, Heart Disease.
Dr. Russell M. Wilder, Rochester, Minn., Nutrition—A Public Health Problem.
Dr. Lawrence Kolb, U. S. Public Health Service, Washington, D. C., Alcoholism and Public Health.
Dr. Harry S. Mustard, New York, Trends in Public Health Administration.
William F. Wells, Philadelphia, Radiant Disinfection of Air.
Dr. Herbert A. Spencer, U. S. Public Health Service, Philadelphia, Health Conditions in Germany.

New York City

Grant for Public Health Teaching.—Cornell University Medical College has received a grant of $600,000 from the Rockefeller Foundation for the endowment of the department of public health and preventive medicine. The department has been receiving an annual grant of $28,000 for the past five years. The endowment will enable the college to expand its teaching in public health, it was said.

Columbia Alumni Meeting.—The Alumni Association of Columbia University College of Physicians and Surgeons held its annual meeting, May 6, at the De Lamar Institute of Public Health. A symposium on "What's New in Public Health" was presented by Dr. Harry Stoll Mustard, John W. Fertig, Ph.D., Frederick B. Flinn, Ph.D., Moses L. Isaacs, Ph.D., Dr. Ernest L. Stebbins and Prof. Earl B. Phelps. The annual dinner was held at the Hotel George Washington in the evening with Professor Phelps presiding and the following speakers: Dr. John L. Rice, city commissioner of health, Leonard J. Piccoli, Ph.D., and Dr. Mustard.

Brooklyn Medical Library.—In the Library of the Medical Society of the County of Kings and the Academy of Medicine of Brooklyn the number of books consulted increased from 63,665 in 1939 to 68,656 in 1940, while the number of books taken home decreased from 13,594 to 12,765. The number of current periodicals and serial publications on file was 1,459, but because of conditions abroad the library was actually receiving at the close of the year about 1,230. Financial support for the Brooklyn library is derived from the general funds of the society, from special societies that meet in the building, from other Brooklyn organizations, from health and welfare organizations and from many individual donors.

Society News.—Drs. Victor W. Eisenstein, Pittsburgh, Emanuel D. Friedman and Charles Davison addressed a combined meeting of the New York Neurological Society and the section of neurology and psychiatry of the New York Academy of Medicine, May 6, on "Brain Abscess of Uncommon Origin: Relation to Osteomyelitis of the Skull" and Dr. Leo Alexander, Boston, on "Electrical Injuries of the Central Nervous System."——A symposium on "sclerosing therapy" was presented before the Bronx County Medical Society, April 16, by Drs. Grant P. Pennoyer, Frank C. Yeomans, New York, and Daniel C. Patterson, Bridgeport, Conn.——Dr. William Cook Spain addressed the Academy of Pathological Science, May 2, on "Hypersensitiveness to Common Foods."——Drs. Thomas A. Shallow, Philadelphia, and James Murray Flynn, Rochester, addressed the Medical Society of the County of Kings, Brooklyn, April 15, on "The Surgical Aspects of Peptic Ulcer" and "The Individual Physician's Obligation to Medical Organization" respectively.

Dr. Knapp Awarded Medal.—The Leslie Dana Gold Medal, awarded annually for outstanding achievements in the prevention of blindness and the conservation of vision, will be presented this year to Dr. Arnold Knapp, formerly professor of ophthalmology at Columbia University College of Physicians and Surgeons. The medal is given by Mr. Leslie Dana of St. Louis through the St. Louis Society for the Blind and on the recommendation of the Association for Research in Ophthalmology. Dr. Knapp was born in New York in 1869 and graduated at Columbia University College of Physicians and Surgeons in 1892. He was professor of ophthalmology at his alma mater from 1903 to 1928. He was executive surgeon at the Herman Knapp Memorial Hospital until it merged last year with the Institute of Ophthalmology of the Columbia-Presbyterian Medical Center. For a number of years he has been editor of the *Archives of Ophthalmology*. He was also chairman of the Section on Ophthalmology of the American Medical Association, 1925-1926, a position held by his father, the late Dr. Herman Knapp, from 1878 to 1880. The American Ophthalmological Society awarded Dr. Knapp the Lucien Howe Medal in 1937.

NORTH CAROLINA

State Medical Meeting and Election.—Dr. Donnell B. Cobb, Goldsboro, was chosen president-elect of the Medical Society of the State of North Carolina at its annual meeting in Pinehurst May 2. Dr. Franklin W. Griffith, Asheville, was installed as president. Other officers include Drs. Thomas D. Sparrow, Charlotte, and Thomas L. Carter, Gatesville, vice presidents, and Roscoe D. McMillan, Red Springs, secretary-treasurer. The 1942 meeting will be in Charlotte. Speakers who addressed general sessions were:

Dr. Frank H. Lahey, Boston, President of the American Medical Association, Developments in Medicine, Economic and Scientific.
Dr. Louis H. Clerf, Philadelphia, Tumors of the Larynx and Hypopharynx.
Dr. Thomas M. Watson, Greenville, Appendicitis in Small Children.
Dr. James Watson, Raleigh, The Medical Profession and the Problem of Mental Disorder.
Dr. Wilburt C. Davison, Durham, The First Ten Years of Duke University School of Medicine and Duke Hospital (McBrayer Memorial Lecture).
Dr. James W. Tankersley, Greensboro, Surgical Aspects of Splenic Disease.
Dr. William T. Rainey, Fayetteville, Management of Congestive Heart Failure.
Major Elmus D. Peasley, Raleigh, The Physical Status of the Selective Service Draftees.
Dr. Charles Hampton Mauzy Jr., Winston-Salem, Cesarean Section, Incidence and Fetal Mortality in Some Cities in North Carolina.

The North Carolina Public Health Association held its annual meeting May 19, with Dr. Harry Stoll Mustard, New York, as guest speaker on "Relationships in State and Local Public Health Work."

OHIO

New Medical Supervisor for Industrial Commission.—Dr. Henry P. Worstell, Columbus, who has been assistant supervisor of the medical section of the State Industrial Commission, has been appointed supervisor. He succeeds Dr. Sidney M. McCurdy, Columbus, who resigned.

Personal.—Dr. Chester A. Spitler, Middletown, has been named health commissioner of the town to succeed the late Dr. George D. Lummis.——Dr. Alfred P. Cole, Cincinnati, has been appointed medical director of the Hamilton County Home and Chronic Disease Hospital, Cincinnati, to succeed Dr. Miles J. Scott, it is reported.——Dr. George F. Zinninger, Canton, was guest of honor at the annual dinner of the Canton Academy of Medicine recently, celebrating his completion of fifty years in the practice of medicine.

Society News.—Dr. Walter L. Dandy, Baltimore, addressed the Academy of Medicine of Cincinnati, April 15, on "Diagnosis and Treatment of Lesions of the Cranial Nerves." Dr. John de J. Pemberton, Rochester, Minn., was the speaker, April 29, on "Present Status of Surgery of the Spleen."——Dr. Warren T. Vaughan, Richmond, Va., addressed the Academy of Medicine of Cleveland, May 16, on "Allergy and Its Relation to Chronic Diseases." The academy orchestra gave its spring concert in Severance Hall, May 10, for the benefit of the Health Education Foundation.——Dr. John A. Toomey, Cleveland, addressed the Mahoning County Medical Society, Youngstown, May 20, on "Diagnosis and Treatment of Scarlet Fever, with Special Reference to the Use of Sulfanilamide, Scarlet Fever Antitoxin and Convalescent Serum" and on "The Portal of Entry of Poliomyelitis." Dr. Edward H. Cary, Dallas, Texas, was the speaker June 6 on "Political Medicine."

PENNSYLVANIA

Society News.—Dr. Andrew B. Fuller, Pittsburgh, addressed the McKeesport Academy of Medicine, April 28, on "Hypertension and Coronary Diseases."——Dr. Gilson C. Engel, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, May 13, on "Diseases of the Thyroid Gland."——Dr. Francis F. Borzell, Philadelphia, addressed the Northampton County Medical Society, May 16, at the Northampton Country Club near Easton on "What Medical Defense Means to the County Societies."

Philadelphia

Special Meeting on Nutrition.—The committee on nutrition and deficiency diseases of the Philadelphia County Medical Society and the Philadelphia Child Health Society sponsored a special meeting on nutrition May 9, with the following speakers: Drs. Rufus S. Reeves on "Nutrition—The Cornerstone of National Defense"; Herbert T. Kelly, "Medical Aspects of Nutrition"; Ralph M. Tyson, "Effect of Nutrition of the Mother on the Health of the Baby," and Pauline Beery Mack, Ph.D., State College, "Mass Studies in Human Nutrition."

Doctors' and Nurses' Night.—The Philadelphia County Medical Society devoted its meeting May 14 to "Doctors' and Nurses' Night." Nursing facilities available to physicians and patients in Philadelphia County were explained by representatives of official groups of nurses and the following addresses were given: Drs. Edgar van Nuys Allen, Rochester, Minn., on "The Blood Pressure Problem"; Francis F. Borzell, "The Handmaiden of Modern Medicine"; Miss Katharine Tucker, director of nursing education, University of Pennsylvania, "Nursing and National Defense," and Mrs. Katharine Miller, general secretary, Pennsylvania State Nurses' Association, "Pennsylvania and the Nursing Inventory."

Pittsburgh

Medical Research at Mellon Institute.—The annual report for the thirtieth year of the Mellon Institute of Industrial Research, for the fiscal year ended March 1, states that the institute has spent $1,258,866 in studies in pure science. There have been 187 fellows and 114 fellowship assistants working under ninety-three industrial fellowships. Chemical, bacteriologic and clinical investigations on the chemotherapy of pneumonia have continued to be important in the institute's program in cooperation with a staff of medical associates at Mercy Hospital in Pittsburgh. Other phases of chemotherapy have been under investigation at the Western Pennsylvania Hospital, notably natural resistance factors in pneumococcic infection and the common cold and in basic bacteriologic experimentation bearing on therapeutic procedure. Another project is concerned with pharmacopeial standards for surgical dressings and gut and silk sutures. During the past year the nutrition fellowship of the Buhl Foundation terminated its five year program of research on the relation of foods to dental caries. The conclusion was reached that preeruptive influences are dominant in the subsequent susceptibility of rat teeth to caries. Air Hygiene Foundation, whose headquarters are in the institute, is reported to be revising its programs of medical and engineering research to stress projects of more immediate benefit in the national emergency. More attention is to be given to chemical hygiene, a study of sick absenteeism in industry and plant surveys for member companies to combat occupational hazards incident to increased production. This foundation supports research at the Harvard School of Public Health, the Saranac Laboratory at Saranac Lake, N. Y., and the University of Pennsylvania, Philadelphia.

VIRGINIA

Regional Meetings.—At a meeting of the South Piedmont Medical Society in Danville, April 16, the speakers included Drs. Edwin C. Hamblen, Durham, N. C., on "Diagnosis and Treatment of Ovarian Failure During the Reproductive Period"; Porter P. Vinson, Richmond, "Significance of Difficulty in Swallowing"; George B. Craddock, Lynchburg, "Sulfonamide Drugs"; Isham K. Briggs, South Boston, "Treatment of Industrial Injuries," and Samuel R. Newman, Danville, "Convulsions During Anesthesia." Dr. Edwin E. Barksdale, Danville, was elected president.——A symposium on pain was presented at the spring meeting of the Southwestern Virginia Medical Society in Pulaski, April 18, by Drs. Isaac A. Bigger, William B. Porter, Robert Finley Gayle Jr., William Gayle Crutchfield and Carrington Williams, all of Richmond. In the evening Dr. Walter B. Martin, Norfolk, president of the Medical Society of Virginia, gave an address on "The Use of Sulfanilamide Drugs by the General Practitioner with Special Reference to Toxic Reactions."

WISCONSIN

George Crownhart Dies Suddenly.—Jesse George Crownhart, Madison, since 1923 executive secretary of the State Medical Society of Wisconsin, died June 5 of coronary thrombosis while attending the Annual Session of the American Medical Association in Cleveland. Mr. Crownhart was born in Superior, Oct. 8, 1896, and graduated from the University of Wisconsin in 1921. For the subsequent two years he served as legislative correspondent for the Holmes News Service. Since 1923 he has been executive secretary of the state medical society and managing editor of the *Wisconsin Medical Journal*. He was secretary of the Wisconsin Hospital Association, 1930-1937, and a member of the governor's Committee on Public Welfare, 1936-1937, and was for many years an officer in the Wisconsin National Guard. He was a member of the Wisconsin Historical Society, American Hospital Association, Wisconsin Press Association, and National Collegiate Players. He was joint author of "Who's Who at Wisconsin," 1920, and "Medical Blue Book of Wisconsin," 1928 and 1929. In 1937 the state medical society sent Mr. Crownhart abroad to study medical care operating under governmental control in various countries; his report, entitled "Sickness Insurance in Europe," was published in 1938. Mr. Crownhart was an indefatigable worker and an able administrator.

PHILIPPINE ISLANDS

Department of Health and Public Welfare.—The Philippine legislature has approved the creation of a department of health and public welfare to take the place of the former administration as a division of the department of public instruction. Dr. Jose Fabella, Manila, who has been commissioner of health and welfare under the former arrangement, has been appointed secretary of health, and Dr. Hilario Lara, Manila, is undersecretary. The *Journal* of the Philippine Medical Association notes that the association has been urging the creation of this separate department of health in its official deliberations since 1931. Previously a law authorizing such a department was passed by the legislature in 1923, but it was vetoed by Governor General Leonard Wood, who nevertheless expressed his favorable opinion of it in principle, the *Journal* said.

GENERAL

League of Nations Narcotic Office Moved to Washington.—According to the Washington (D. C.) *Times-Herald*, April 12, the narcotics division of the League of Nations has been moved to Washington from Geneva, Switzerland. It was said that powers involved in the European war are still contributing to the cooperative effort to regulate the flow of narcotics among the sixty-seven nations participating in the international narcotics agreements.

Association for Study of Neoplastic Diseases.—The summer meeting of the American Association for the Study of Neoplastic Diseases will be held at Johns Hopkins Hospital, Baltimore, June 26-28, under the presidency of Dr. Roscoe W. Teahan, Philadelphia. The meeting has been planned partly as a demonstration of gross and microscopic pathology and partly a demonstration of x-ray films and lantern slides. Every member is urged to attend, bringing both microscope and material for presentation. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue, N.W., Washington, D. C., is the secretary. The annual meeting of the association will be held in Washington, September 4-6.

Fellowships Awarded in Cancer Research.—The Finney-Howell Research Foundation, Inc., Baltimore, announces that the following fellowships have been awarded for research into the cause or causes and the treatment of cancer:

Dr. Glenn Horner Algire, to work at the National Cancer Institute, Bethesda, Md.

Dr. Joseph Gilbert Hamilton, to work at the Radiation Laboratory, University of California, Berkeley.

Dr. Rose I. Shukoff, to work at the Glasgow Royal Cancer Hospital, Glasgow, Scotland.

Fellowships were renewed for a year for Margaret Nast Lewis, Ph.D., Berkeley, Calif.; Bernerd E. Kline, M.S., Madison, Wis.; Dr. Julius B. Charles Abels, New York; Alfred Marshak, Ph.D., Berkeley; Dr. John F. Menke, San Francisco, and Dr. Paul C. M. Zamecnik, New York. Fellowships carrying an annual stipend of $2,000 are awarded for the period of one year, with the possibility of renewal up to three years, at the annual meeting of the board of directors, held at the end of February. Applications must be made on blanks furnished by the secretary and filed in the office of the foundation before Jan. 1, 1942.

Association on Mental Deficiency.—The sixty-fifth annual convention of the American Association on Mental Deficiency will be held in Salt Lake City, June 20-24, under the presidency of Meta L. Anderson, Ph.D., Newark, N. J. The speakers will include:

Dr. Gilbert J. Rich, Milwaukee, The Borderline Defective in the Community.

Dr. E. Arthur Whitney, Elwyn, Pa., The Municipal Court of Philadelphia Studies the Problem of Mental Deficiency.

Sidney L. Halperin, M.A., and Dr. George M. Curtis, Columbus, Ohio, Anhidrotic Ectodermal Dysplasia Associated with Mental Deficiency.

Dr. Emilian O. Houda, Tacoma, Wash., Most Primary Factors Necessary to the Increasing Incidence of Cretinism.

Dr. Charles C. Hawke, Winfield, Kan., Castration versus Vasectomy in the Feebleminded as a Surgical Problem.

Dr. Louis P. Harshman, Fort Wayne, Ind., Human Sterilization Before Puberty.

Dr. James Lewald, Laurel, Md., Cortical Excision for the Allaying of Tremor.

Dr. Theodore A. Watters, New Orleans, Detecting Schizophrenic Personalities.

Dr. George A. Jervis, New York, Certain Neuropathological Studies of Mental Deficiency at Letchworth Village.

Memorial to Father of American Pharmacy.—A bronze statue of William Proctor Jr., designated the "Father of American Pharmacy," was unveiled in the foyer of the American Institute of Pharmacy, Washington, D. C., May 3, the one hundred and thirty-fourth anniversary of his birth. William Marks Simpson, Baltimore, is the sculptor of the statue. The presentation was made to the American Pharmaceutical Association. Ivor Griffith, Pharm.D., president of the Philadelphia College of Pharmacy and Science, delivered the principal address. William Proctor Jr. was born in Baltimore in 1817. In 1831 he apprenticed himself to a pharmacist in Philadelphia and graduated at the Philadelphia College of Pharmacy and Science in 1837. He conducted his own pharmacy from 1844 in Philadelphia until his death in 1874. In 1840 he became a member of the Philadelphia College of Pharmacy, in 1841 he was elected to its board of trustees, in 1855 he was made corresponding secretary, in 1867 he became vice president and in 1872 he accepted the chair of pharmacy on the death of Prof. Edward Parrish. He was one of the founders of the American Pharmaceutical Association, serving as president in 1852.

Surgery Board Acts to Certify Proctologists.—At the annual meeting of the American Board of Surgery May 1 a plan of examination to certify proctologists was adopted by members of the board of surgery and representatives of the proctologists. This plan requires that every candidate wishing to be qualified in the field of proctology by examination shall meet all the requirements exacted by the American Board of Surgery as to training and pass its examinations. If the candidate passes the prescribed examinations and becomes eligible for certification by the board of surgery he shall then take an additional examination to be given by an examining committee appointed by the proctologic group in that special field. On the passing of this additional examination, which may follow immediately on the final one given by the American Board of Surgery, he may then be certified by the American Board of Surgery as having been qualified in general surgery with special reference to the field of proctology. At the recent meeting the American Board of Surgery elected the following officers, among others: Drs. Allen O. Whipple, New York, chairman; Fred W. Rankin, Lexington, Ky., vice chairman, and John Stewart Rodman, Philadelphia, secretary-treasurer.

Northwest Medical Association.—The eighteenth annual meeting of the Pacific Northwest Medical Association will be held at the Davenport Hotel, Spokane, Wash., June 25-28. The ten speakers on the program will each present three papers:

Dr. Russell L. Cecil, New York, Diagnosis and Treatment of Infectious Arthritis, of Osteoarthritis and of Gouty Arthritis.

Dr. Louis H. Clerf, Philadelphia, Clinical Significance of Hoarseness and Its Importance in Cancer of the Larynx; Bronchoscopy in Nontuberculous Pulmonary Disease; The Esophagus and Its Diseases.

Dr. Louis J. Karnosh, Cleveland, Neuritis and Avitaminosis; Mental Disorders Associated with Bodily Disease; Traumatic Neuroses and Bones.

Dr. William J. Kerr, San Francisco, Clinical Use of the Symballophone; Pathologic and Physiologic Factors in Coronary Occlusion; Treatment of Angina Pectoris.

Dr. Perrin H. Long, Baltimore, Experimental, Biological and Pharmacologic Background of Bacterial Chemotherapy; Clinical Use of Sulfanilamide, Sulfapyridine, Sulfathiazole; Recognition and Importance of the Toxic Manifestations of Sulfanilamide and Its Derivatives.

Dr. Carleton Mathewson Jr., San Francisco, The Ambulatory Treatment of Certain Fractures of the Lower Extremities; The Management of Extensive Burns; The Treatment of Compound Fractures.

Dr. John deJ. Pemberton, Rochester, Minn., Surgery of the Thyroid Gland; Lesions of the Colon and Rectum; Present Status of Surgery of the Spleen.

Dr. Samuel Soskin, Chicago, The Fundamentals of the Physiology of Diabetes; Carbohydrate Utilization and Carbohydrate Tolerance; The Endocrine Balance in Carbohydrate Metabolism.

Dr. William Dock, San Francisco, The Nature and Effects of Arterial Hypertension; Albuminuria and Nephrosis; Cirrhosis of the Liver.

Dr. Leighton C. Conn, Edmonton, Alta., Amnesia and Analgesia During Labor; Hemorrhage During Labor; Vaginal Discharges and Their Treatment.

Special Society Elections.—New officers of the Association of American Physicians chosen at its annual meeting in Atlantic City, N. J., recently include Drs. James Howard Means, Boston, president; George Blumer, New Haven, Conn., vice president, and Hugh J. Morgan, Nashville, Tenn., secretary.——Dr. Arthur H. Ruggles, Providence, R. I., was named president-elect of the American Psychiatric Association at its annual meeting in Richmond, Va., in May and Dr. James K. Hall, Richmond, was installed as president. Dr. Winfred Overholser, Washington, D. C., is secretary-treasurer.——Dr. John J. Wittmer, New York, was chosen president-elect of the American Association of Industrial Physicians and Surgeons at its annual meeting in Pittsburgh May 9 and Dr. Theodore Lyle Hazlett, Pittsburgh, was inducted into the presidency. Dr. Edward C. Holmblad, Chicago, was named to the newly created position of managing director. Cincinnati was selected as the place for the 1942 meeting.——Philip Drinker, S.D., Boston, was chosen president-elect of the American Industrial Hygiene Association at its meeting in Pittsburgh in May and Donald E. Cummings, B.S., associate professor of medicine and director of the division of industrial hygiene of the University of Colorado School of Medicine, Denver, was installed as president. Gordon C. Harrold, Ph.D., of the Chrysler Corporation, Detroit, was reelected secretary and Theodore Hatch, Philadelphia, was reelected treasurer.——Officers of the American Society for Pharmacology and Experimental Therapeutics chosen at its meeting in April include Drs. Eugene M. K. Geiling, Chicago, president (reelected); Carl F. Schmidt, Philadelphia, vice president; Raymond N. Bieter, Minneapolis, secretary; Erwin E. Nelson, New Orleans, treasurer.

CORRECTION

Dr. Brücke Did Not Go to East Indies.—An item in the Student Section, May 31, stated that Dr. Ernst Th. von Brücke of the physiology department of Harvard Medical School, Boston, was en route to the Dutch East Indies to work with the Dutch army. This was erroneous. It was Dr. A. Colaco Belmonte, formerly of Amsterdam, who was en route to the Dutch East Indies and who a few years ago served with a Red Cross unit sent by the Netherlands to Ethiopia and more recently to Finland.

Government Services

Changes in Public Health Service

A list of official orders from the U. S. Public Health Service announces the following changes:

Sr. Surg. Herbert A. Spencer, relieved at Berlin, Germany, and ordered to proceed to U. S. Immigration Station, Ellis Island, for duty.

Acting Asst. Surg. Jeremiah J. Donovan, relieved at Toronto, Canada, and ordered to Havana, Cuba, to report to American Consulate General for duty.

Asst. Surg. Ralph B. Dawson, relieved at Ellis Island, N. Y., and ordered to London, England, for duty.

Passed Asst. Surg. Erwin W. Blatter, relieved at London and ordered to U. S. Quarantine Station, Baltimore.

Asst. Surg. Wixom S. Sibley, relieved at Terminal Island, Calif., and ordered to U. S. Quarantine Station, Honolulu, T. H., for duty.

The following have recently been promoted to the titles indicated: Drs. Roscoe R. Spencer, Sanders L. Christian, Royd R. Sayers, Paul M. Stewart and Walter C. Teufel, all medical directors; Carl V. Morrison, Charles G. Spicknall, Vernam T. Davis and Harold T. Castberg, all passed assistant surgeons.

Navy Medical Center at Bethesda

The first unit of the U. S. Naval Medical Center under construction at Bethesda, Md., is nearing completion, newspapers reported April 20. The entire project, when finished, will cost $4,850,000. With a normal capacity of six hundred and fifty beds, it is so arranged that by additional construction in a time of national emergency accommodations will be available for eighteen hundred beds. The unit now nearing completion forms the central tower of the main building and consists of sixteen stories, to house the administrative section, the surgical section including the operating rooms, the x-ray rooms and physical therapy equipment including an orthopedic pool to be used in cases of bone injuries to reduce time of hospitalization. In addition, board rooms and sick officers' quarters will be in the tower, together with the medical library of 22,000 volumes. In the front wings of the central building, three stories in height, will be the medical and dental schools, while the rear wings, also three stories high, will contain thirty-bed wards with room enough for about 100 patients to a wing. In addition to the main building, there will be erected quarters for some of the thirty-five medical officers and six dental officers on the institution's staff, a building for fifty nurses, and barracks for the two hundred and fifty navy hospital corpsmen. The entire plant will occupy more than 200 acres and replace existing facilities in Washington which are now considered inadequate.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 12, 1941.

Pulmonary Tuberculosis in the Navy

At the Section of Epidemiology and State Medicine of the Royal Society of Medicine, Surgeon Rear Admiral Dudley, F.R.S., opened a discussion on pulmonary tuberculosis in the royal navy. He said that since the beginning of the century the invaliding rate for the disease had remained at about 2 per thousand, although the greatest efforts had been made to improve the environment by better ventilation, dust extraction and better diet, and to improve diagnosis by periodic overhauls of the men. Yet during this period the mortality in the country from tuberculosis had been nearly halved. The prevalence of tuberculosis in the navy was due to the factor of population density, which could not be eliminated or even reduced. The purpose for which a warship was designed prohibited any increase of deck space per man, and more and more men were required to work the complicated machinery. The yearly incidence of 2 per thousand seemed to be irreducible and was double the figure for the army and the air force, although the navy had a large proportion of boys and men at those younger and older ages which in civil life showed the lowest incidence of tuberculosis. The closeness of community life on the quarter deck was the determining cause of tuberculosis in the naval ratings. Among the naval officers the yearly incidence was less than 1 per thousand. They nearly always slept in separate cabins and their living accommodation was more spacious.

All men in the navy suspected of having pulmonary tuberculosis were at once examined with the roentgen rays. Little effect on the incidence could be expected from this examination of recruits or of limited numbers of contacts, and periodic roentgen ray examination of the total force by the usual method was impracticable. Therefore mass examination by miniature photoradiography was introduced as less cumbrous and less expensive. No man would be labeled tuberculous on the evidence of a miniature film until a full size film had been taken.

Social Work in Air Raid Shelters

In an address to the Royal Society of Arts on "The Modern Troglodyte," Lord Horder, who was appointed by the government to inspect and report on air raid shelters, said that we heard a lot about foreigners crowding into the shelters, but these folk were under British protection and we must give them security and care for them. That was where we differed from the Nazis. This great and cataclysmal upheaval had brought into the shelters for inspection the slum conditions of which we said we were ashamed. For many of these citizens what the authorities had now been able to establish represented better and happier conditions than they had before night bombing began. This was an indictment of what had been called "our social system." These folk now enjoyed a communal life, though of a rudimentary sort, which bred a spirit of good temper and dignity; it enabled them to adapt themselves to the nation's exigency and spirit. That it should have needed a war and life under ground for half of the twenty-four hours to achieve a result which was bringing joy to the hearts of social workers was a humiliating thought. To get among the ordinary folk and give them sane, simple and homely advice was the dream of doctors with any vision for one hundred years. Here was field work of the best kind in preventive medicine: to keep the fit fit and to make the near fit fit. He believed that from these severe trials would emerge a group of people better fitted to arrange the pattern of their lives in the better days that all were determined to have in the future.

The Casualties of "The Battle of Britain"

For the first time a connected account of the three months almost continuous daylight fighting against the luftwaffe, known as "the battle of Britain," August-October 1940, has been given in an official pamphlet. No fewer than 2,375 German aircraft were known to have been destroyed and many others must have been. The British losses were 375 pilots killed and 358 wounded. In daylight 1,700 persons, nearly all civilians, were killed and 3,360 seriously wounded. At night 12,581 were killed and 16,965 injured. In this greatest air battle in history the German air force was reduced from a confident machine-like organization to a shattered and disordered armada. The object was to obtain a quick decision by destroying our air power and so render invasion possible. Massed formations of bombers escorted by fighters in the initial stage made twenty-six attacks on our ports and shipping. They next attacked fighter airdromes. Attacks were then delivered against inland airdromes and aircraft factories and also against residential districts. Waves of formations of from twenty to forty bombers, protected by a greater number of fighters, were sent over at intervals of twenty minutes. This continued from September 7 to October 5 as the last desperate attempt to obtain victory. Much damage was done but at a cost the Germans could not stand. In one month they lost 883 aircraft. The British losses were less than a sixth of the German.

Preparations Against a Gas Attack

A campaign to tighten up the organization for meeting a gas attack from the air on the civilian population has begun. In the presence of the inspector general of air raid precautions, tests were made in different London districts with tear gas, which had a satisfactory effect on the inhabitants, who took care to have their respirators ready for use. One object was to ascertain how quickly gas could be detected by patrolling wardens and how wardens in neighboring areas would act. To help practical training, a convoy of casualty service vehicles was driven through the concentration of gas, together with a section of the auxiliary fire service, whose members carried out a "dry hose drill." Another concentration of gas was laid outside a large department store and adjoining streets and premises as a test for the anti-gas precautions in the district and the air raid precautions service in the store, while the effects on the customers in the store were especially noted. An important point observed was the extent to which the gas penetrated the building and the height at which it might be effective.

The public response to the appeal of the authorities for cooperation was admirable. Gas masks were put on whenever they were required, and the injunction not to take cover or attempt to get into the shelters before putting them on was strictly obeyed. Persons carrying parcels obeyed the instruction to place them on the ground where they stood and then put on the masks. It is intended to repeat these tests, which were made at the request of the government, in other parts of the country.

The danger of invasion seems to have become more remote in consequence of the Balkan war. But the government has shown by repeated warnings that it expects a gas attack on the civilian population. It has issued to householders fifteen million leaflets entitled "What to Do about Gas." They contain the following: "The danger is not serious if you do the right thing. In your gas mask you have the best possible protection against gases that affect your lungs or eyes. Carry your mask always. Buy a jar of antigas ointment. If the rattles sound, put on your mask and take cover and keep it on until you hear handbells ringing the "Gas clear." Cover your skin up outdoors—hands in pockets, collar turned up. If you have an umbrella, put it up. Never look upward—you may get a drop of liquid gas in the eye. If you breathe any gas or vapor put on your mask at once. If the irritation is serious, go to a

first aid post. If you are splashed with liquid gas from a bomb and you can see the dark splash on your skin or clothing, dab, not wipe, as much as you can of the liquid off your skin and then rub in the ointment. Your handkerchief has become dangerous—destroy it. If you have not the ointment, wash at once with soap and water. This may save you a bad burn. Take off any splashed outer garment at once, before the liquid soaks through. If you are within five minutes of any place where you can get a wash, go there and wash yourself. Before going in, take off your shoes and any clothing which you think has been splashed.

"Poison gases will not always affect exposed foods to such an extent that they become dangerous, but in any case simple precautions will protect your foods. Food in cans or airtight bottles is perfectly safe, and flour, rice, tea and butter should be kept in tins or jars with fitting lids. Refrigerators are very good protection. If there is any risk that your food or water may have been contaminated, do not attempt to deal with them yourself. Notify the police or the air raid wardens."

Physiologic Problems of Flying

In the House of Commons the air minister, Sir Archibald Sinclair, stated that in flying special attention was being paid to the problem of cold, to the supply of oxygen at high altitudes and to night vision. The development of aircraft tended toward flying at great heights, and research was continuous in search of a solution of the physiologic problems involved. The problem of cold was being tackled by the sealing up—a difficult problem in a fighting aircraft—and the heating of cabins and by the provision of equipment, boots, gloves, helmets and underclothing of special design. The psychologic care of pilots was not less important. The early detection of signs of flying strain formed an important part of the duties of medical officers of the air force. The fighting spirit of the pilots was so strong that unless they were closely watched they kept on flying long after they should have rested from operations. The medical officer's duty was to catch them in time, so that the squadron or station commander could make them rest. Good results had been achieved. The incidence of flying strain was considerably less than was expected before the war. The four orthopedic centers of the air ministry were second to none in the country today. Behind these were rehabilitation centers situated in the most healthful part of the country, at which modern methods were applied to secure recovery as quickly as possible. In addition, centers with the most modern forms of treatment for severe burns had been established.

Science and the War Effort

Replying to a question in the House of Lords, Lord Hankey, chancellor of the duchy of Lancaster, said that scientific research in our war effort had three main pillars: the Department of Scientific and Industrial Research, the Medical Research Council and the Agricultural Research Council. The Scientific Advisory Committee to the government was in close touch through the Royal Society with the great streams of scientific research and development. The sphere of the Medical Research Council extended far beyond "medical" as this term was generally understood. It was concerned with all problems that affected man's health and efficiency and therefore assisted the defense department by promoting these in the men who operated machines such as aircraft and tanks. Research activities covered the whole field of the application of science to war. Among the subjects dealt with were the innumerable problems of the submarine, the submarine mine, the bomber and the fighter, their location by day and by night, in thick weather or in clear, the means of destroying them when located, and gas warfare in all its branches. Research in every item was being pursued systematically all over the country by an army of scientists. Our scientists were at least as good as those of the enemy. With the aid of the scientific resources of the empire, and especially of the United States, we were building a scientific equipment destined to play an ever increasing part in our war effort.

BUDAPEST

(From Our Regular Correspondent)

March 15, 1941.

The Organization of Blood Donors

The Hungarian Red Cross Society started in the spring of 1940 to recruit blood donors. About six thousand women and girls have been supplied with printed matter, to wit, journal sheets of four colors corresponding to the blood group. On these sheets the result of clinical examination, the personal data of the donor, her short history and the respective blood group are recorded. To date only 1,955 women have been subjected to the different tests and of these 1,447 were found fit. The age of the applicants varied between 15 and 60 years. The Red Cross Society stated that in case of war the number of blood donors needed will be about ten thousand. Those who donate blood for saving wounded soldiers more than once will receive bronze medals as a special distinction, and they will be exempted from a part of the compulsory labor service that will be introduced in Hungary shortly; they will also enjoy priority if applying for any public position. In case of mobilization a certain contingent of women will be called in and their blood will be stored and taken to the front by airplanes. The stored blood will be kept for four weeks, and beyond this time it will not be used for transfusion.

Prophylactic Inoculations Against Diphtheria

The ministry of internal affairs enacted the compulsory prophylactic inoculation against diphtheria of all children in their second year of life. The inoculations are made by the medical officers of health in towns and cities and by the district physicans in villages. The inoculations are made free of charge without regard to the financial position of the parents. No inoculations are made if there is medical evidence that the child has survived diphtheria or received within the last two years regular inoculation or if feverish or if suffering from an infectious disease, or if the body is much debilitated. With the same enactment the minister ordered the inoculation also of 7 year old children. These will be made in the schools by the school physicians.

The Treatment of Cerebrospinal Meningitis with Sulfanilamide Preparations

At a recent meeting of the medical society Dr. Molitor gave an account of his experience gained in connection with 75 cases of cerebrospinal meningitis. In about 85 per cent of the cases the fever abated on the second or third day of treatment and the patients were out of bed on the fifth or sixth day of treatment. If oral administration was not feasible on account of vomiting, the drug was introduced anally through a catheter pushed up to the sigmoid. Improvement and cure were striking in almost all cases.

Marriages

MONTGOMERY A. STUART, Captain, M. C., U. S. Navy, to Mrs. Charles Fague Williams at Annapolis, Md., April 26.

ROBERT A. DEMO, Rochester, N. Y., to Miss Vilma Arseneau of Campbellton, N. B., Canada, April 19.

JOHN F. KEARNS, Dutch Harbor, Alaska, to Miss Betty Merriam of Wallace, Idaho, April 14.

ROBERT PROSSER MORROW JR., New Orleans, to Miss Lelia Terry in Laurel, Miss., April 5.

CHARLES E. ERWAY, Rochester, N. Y., to Miss Edith Daugard of Syracuse, April 12.

Deaths

Albert Graeme Mitchell ● Cincinnati; University of Pennsylvania School of Medicine, Philadelphia, 1910; chairman of the Section on Pediatrics of the American Medical Association, 1934-1935; instructor in pediatrics from 1919 to 1921 and associate in pediatrics from 1921 to 1924 at his alma mater; since 1924 B. K. Rachford professor of pediatrics at the University of Cincinnati College of Medicine; member of the American Pediatric Society, American Academy of Pediatrics and the Central Society for Clinical Research; past president of the Central States Pediatric Society and the Philadelphia Pediatric Society; in 1932 was elected a member of the National Board of Medical Examiners; member of the medical committee of the National Foundation for Infantile Paralysis; medical director of the Babies Milk Fund Association in Cincinnati; in 1929 member of the White House Conference on Child Health and Protection; delegate to the second International Congress of Pediatrics in Stockholm, Sweden, in 1930; in 1938 vice president of the Pan American Medical Association Section on Pediatrics 7th Cruise Congress; during the World War served as adjutant of Hospital Unit A, as superintendent and medical director of the American Hospital for Civilian Population at Neufchateau, France, with the 149th machine gun battalion of the 42d division in the San Mihiel and Argonne offensives, and with the Army of Occupation in Germany; was commissioned a major in the medical reserve corps in 1926; member of the city board of health from 1926 to 1930; director of pediatrics and contagious diseases, Cincinnati General Hospital; chief of staff and medical director of the Children's Hospital; director of the Children's Hospital Research Foundation; consulting pediatrician to the Ohio Soldiers' and Sailors' Orphan Home, Xenia; co-author with Dr. J. P. Crozer Griffith of Philadelphia of "Textbook of Diseases of Infants and Children," now known as the "Textbook of Pediatrics"; co-author of "Pediatrics and Pediatric Nursing"; a chief associate editor of "Cyclopedia of Medicine"; on the editorial board of the *American Journal of Diseases of Children;* aged 52; died, June 1.

John Rosslyn Earp, Albany, N. Y.; L.R.C.P., London, and M.R.C.S., England, 1917; was director of the health department of Antioch College, Yellow Springs, Ohio, from 1923 to 1927; lecturer at the University of Colorado, Denver, 1928-1929; director of public health of the state of New Mexico from 1931 to 1937; became associated with the New York State Department of Health in 1937, when he was appointed medical editor of the division of public health education; served with the British Red Cross, Belgium, 1914-1915 and medical officer of the French Red Cross, 1917-1918; was awarded the Mons medal and the Medaille de la Reconnaissance Française; member of the Medical Society of the State of New York; assistant editor of the *Lancet,* 1919; editor of *Tubercle,* 1919-1920; associate editor of the *International Journal of Public Health,* 1920-1922; scientific editor of *Colorado Medicine,* 1929-1930; member of the publications committee of *Public Health Nursing;* aged 49; died, May 19.

Jacob Morgan Coffin ● Colonel, United States Army, retired, San Francisco; University of Pennsylvania Department of Medicine, Philadelphia, 1900; entered the army as an assistant surgeon in 1902; at one time assistant professor of military science and tactics at his alma mater; served during the World War; was promoted through the various grades to that of colonel in 1928; retired in 1934 for disability in line of duty; aged 62; died, April 16, in the Letterman General Hospital of carcinoma of the tongue.

Roderick Duncan Kennedy ● Globe, Ariz.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; member of the House of Delegates of the American Medical Association, 1928-1929; past president of the Arizona State Medical Association and the Southwestern Medical and Surgical Association; fellow of the American College of Surgeons; on the staff of the Gila County Hospital; aged 62; died, March 19, in St. Joseph's Hospital, Phoenix, of coronary thrombosis.

Arthur Storer Driscoll ● Staten Island, N. Y.; Fordham University School of Medicine, New York, 1911; fellow of the American College of Surgeons; past president of the Richmond County Medical Society; served during the World War; member of the official advisory health preparedness committee; on the staffs of the Staten Island Hospital and the Richmond Memorial Hospital; aged 53; died, April 27.

James Harvey Baldwin, Baltimore; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; fellow of the American College of Surgeons; formerly on the staff of the Methodist Episcopal Hospital, Philadelphia; served during the World War; aged 69; died, April 18, in the Veterans Administration Facility, Coatesville, of arteriosclerosis.

Patrick George McGill, Superior, Wis.; School of Medicine and Surgery, Montreal, Que., Canada, 1890; member of the State Medical Society of Wisconsin; past president of the Douglas County Medical Society; formerly city health officer; served during the World War; aged 80; formerly on the staff of St. Mary's Hospital, where he died, April 23, of bronchopneumonia.

Loring Bradford Packard, Brockton, Mass.; Harvard Medical School, Boston, 1903; member of the Massachusetts Medical Society and the New England Roentgen Ray Society; on the staff and formerly superintendent of the Brockton Hospital; aged 63; died, April 12, in the New England Baptist Hospital, Boston, of hemorrhage resulting from aneurysm of the aorta.

George Clinton Hafford ● Albion, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; served during the World War; formerly member of the school board; aged 78; died, April 19, in St. Petersburg, Fla., of coronary occlusion.

Eugene Stephen Knox ● Green Bay, Wis.; Marquette University School of Medicine, Milwaukee, 1914; past president and secretary of the Brown-Kewaunee-Door Counties Medical Society; served during the World War; formerly president of the staff of St. Mary's Hospital; aged 54; died, April 1, of streptococcic infection following an appendectomy.

Arthur Henry Stall, Akron, Ohio; Western Reserve University Medical Department, Cleveland, 1901; member of the American College of Radiology; past president of the Summit County Medical Society; served during the World War; formerly on the staff of the Akron City Hospital; aged 64; died, April 21, of carcinoma of the rectum.

Horace Chauncey Lyman ● Chicago; University of Illinois College of Medicine, Chicago, 1915; fellow of the American College of Surgeons; served during the World War; on the staffs of the Edgewater Hospital and the Alexian Brothers Hospital, Chicago, and the West Suburban Hospital, Oak Park, Ill.; aged 48; died, April 13.

Michael Earley Murray Jr., Cambridge, Mass.; Harvard Medical School, Boston, 1932; member of the Massachusetts Medical Society; physician to the hygiene department, Harvard University; assistant in medicine, Massachusetts General Hospital, Boston; aged 36; died, April 21, in the McLean Hospital, Belmont.

George William Kutscher Jr., Asheville, N. C.; University of Pittsburgh School of Medicine, 1923; member of the Medical Society of the State of North Carolina and the American Academy of Pediatrics; formerly secretary of the Buncombe County Medical Society; aged 44; died, April 15, in Philadelphia.

Charles Gipson Dewey, Boston; Dartmouth Medical School, Hanover, N. H., 1886; member of the Massachusetts Medical Society and of the American Psychiatric Association; assistant superintendent of the Boston City Hospital from 1895 to 1899; aged 80; died, April 19, of hypostatic pneumonia and myocarditis.

Charles Henry Hall, Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1902; member of the Medical Society of the State of New York; at various times on the staffs of the Coney Island, Caledonian, Victory and Bay Ridge hospitals; aged 64; died, April 21, of cerebral thrombosis.

George Johnson Tompkins, Lynchburg, Va.; Medical College of Virginia, Richmond, 1894; member of the Medical Society of Virginia; on the staffs of the Lynchburg General Hospital, Marshall Lodge Memorial Hospital and the Virginia Baptist Hospital; aged 68; died, April 2, of heart disease.

Greta Frankenberg, Kew Gardens, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1919; member of the Medical Society of the State of New York; on the staff of the Long Island College Hospital, Brooklyn; aged 45; died, April 25, of carcinoma.

Lawrence Tweedie Sidwell, Pomona, Calif.; University of Nebraska College of Medicine, Omaha, 1908; at one time superintendent of the Hospital for the Tuberculous, Kearney, Neb., and the Nebraska Institution for the Feebleminded, Beatrice; aged 58; died, April 11, of heart disease.

Farel Jouard ● New York; New York Homeopathic Medical College and Flower Hospital, New York, 1918; on the staffs of the Mount Sinai Hospital, Polyclinic Hospital and the Gouverneur Hospital; aged 57; died, April 27, at his home in New Rochelle of lymphosarcoma.

Mary H. Fletcher Perkins, Steilacoom, Wash.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; member of the Washington State Medical Association; formerly on the staff of the Western State Hospital; Fort Steilacoom; aged 83; died, April 7.

Ralph C. Matheny ● Galesburg, Ill.; Northwestern University Medical School, Chicago, 1891; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; consulting oculist, Galesburg Hospital; aged 82; died, April 18.

Rex Vale Henry, Hedrick, Iowa; John A. Creighton Medical College, Omaha, 1901; member of the Iowa State Medical Society; served during the World War; aged 66; died, April 17, in St. Joseph Hospital, Ottumwa, of retroperitoneal tumor and volvulus and peritonitis.

William Fritchey Roth, Wilkes-Barre, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; on the staff of the Wyoming Valley Homeopathic Hospital; aged 69; died, April 1, of cerebral hemorrhage.

Walter Branham Hendrick, Hurtsboro, Ala.; University of Louisville (Ky.) Medical Department, 1890; member of the Medical Association of the State of Alabama; aged 72; died, April 21, in the City Hospital, Columbus, Ga., of cholecystitis and coronary heart disease.

Peter Christian Heinrich Pahl, Los Angeles; Bennett College of Eclectic Medicine and Surgery, Chicago, 1893; University of Southern California College of Medicine, Los Angeles, 1901; physician in charge and owner of a hospital bearing his name; aged 71; died, April 14.

David Low, Regina, Sask., Canada; McGill University Faculty of Medicine, Montreal, Que., 1889; past president of the Saskatchewan Medical Association and the Canadian Medical Association; member of the Saskatchewan Cancer Commission; aged 72; died, March 9.

George William Overmeyer, Retsil, Wash.; Curtis Physio-Medical Institute, Marion, Ind., 1888; Chicago Physio-Medical Institute, 1893; Hospital College of Medicine, Louisville, Ky., 1896; served during the World War; aged 78; died, April 5, of cerebral hemorrhage.

A. E. McLarty, Secaucus, N. J.; Western University Faculty of Medicine, London, Ont., Canada, 1909; served during the World War; on the staff of the Hudson County Hospital; aged 52; died, April 22, in the Medical Center of Jersey City of cerebral arteriosclerosis.

William Marcus Kendall, Beverly Hills, Calif.; Pulte Medical College, Cincinnati, 1892; formerly health officer, police surgeon and member of the board of education of Venice; aged 71; died, April 6, in the Hospital of the Good Samaritan of spontaneous pneumothorax.

Griffith Moses Jones ● Minneapolis; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; on the staff of the Norwegian Deaconess Hospital, aged 70; died, April 16, in Petersburg, Va., of coronary occlusion.

Henry Louis Schelling, Brooklyn; University of the City of New York Medical Department, 1890; member of the Medical Society of the State of New York; served during the World War; aged 75; died, April 13, in the Brooklyn Hospital of cerebral hemorrhage.

Charles William Simpson, Dallas, Texas; University of Tennessee Medical Department, Nashville, 1889; member of the State Medical Association of Texas; formerly medical director of the American Life Re-Insurance Company; aged 75, died, April 17.

Homer Hopkinson Marks, Berlin, N. H.; Medical School of Maine, Portland, 1906; member of the New Hampshire Medical Society; aged 65; on the staff of St. Louis Hospital, where he died, April 11, of injuries received when he fell down the elevator shaft.

John Francis Hackett, Waterbury, Conn.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1906; member of the Connecticut State Medical Society; served during the World War; aged 61; died, April 6, of coronary occlusion.

Austin Rodgers Kracaw, Denver; University of Colorado School of Medicine, Denver, 1911; member of the Colorado State Medical Society; on the staffs of St. Joseph and Presbyterian hospitals; aged 54; died, April 4, of coronary thrombosis.

William Edward Foy, Fort Pierce, Fla.; Temple University School of Medicine, Philadelphia, 1933; member of the Florida Medical Association; on the staff of the Fort Pierce Memorial Hospital; aged 33; died, April 16, of coronary occlusion.

Estie Eri Hunt, Pendleton, Ind.; Indiana University School of Medicine, Indianapolis, 1926; at one time a member of the school board of Pendleton; aged 39; died, April 7, in the Indiana State Sanatorium, Rockville, of pulmonary tuberculosis.

Farn Butt Chu ● New York; Yale University School of Medicine, New Haven, Conn., 1930; aged 37; on the staffs of the Morrisania Hospital, Hospital for the Ruptured and Crippled and the Lenox Hill Hospital, where he died, April 19.

Asa Kelly Shelton, Oliver Springs, Tenn.; Vanderbilt University School of Medicine, Nashville, 1881; University of Nashville Medical Department, 1882; aged 84; died, April 7, in a hospital at Knoxville of carcinoma of the prostate.

Herbert Willis, Beach Haven, N. J.; Jefferson Medical College of Philadelphia, 1904; for many years mayor of Beach Haven, and county coroner; bank president; aged 59; died, April 8, of arteriosclerosis and cerebral hemorrhage.

Oscar Elmer Hofmann, West Hazleton, Pa.; Jefferson Medical College of Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; for many years school physician; aged 71; died, April 18, of heart disease.

Arthur Burns ● Houston, Texas; Johns Hopkins University School of Medicine, Baltimore, 1923; served during the World War; formerly director of the division of tuberculosis, state department of health; aged 44; died, April 8.

Howard Roxboro Elliot ● Grimsby, Ont., Canada; University of Toronto Faculty of Medicine, 1881; L.R.C.P. and L.R.C.S., Edinburgh, Scotland, 1881; member of the Colorado State Medical Society; aged 82; died, April 1.

Libbie Seymour Cammack, Maitland, Fla.; State University of Iowa College of Medicine, Iowa City, 1904; at one time a medical missionary; aged 64; died, April 5, in the Florida Sanitarium and Hospital, Orlando.

Caroline Reed, Veedersburg, Ind.; Northwestern University Woman's Medical School, Chicago, 1899; for many years on the staff of the Iola-Monroe County Tuberculosis Sanatorium, Rochester, N. Y.; aged 74; died, April 4.

Merritt Owen Wilkins ● Chicago; the General Medical College, Chicago, 1924; served during the World War; on the staff of the Illinois Masonic Hospital; aged 51; died, April 6, of coronary thrombosis and hypertension.

James Franklin Hilton ● Washington, D. C.; Georgetown University School of Medicine, Washington, 1904; aged 62; on the staff of the Georgetown Hospital, where he died, April 18, of carcinoma of the cecum.

Warren Leroy Lindsay, Salt Lake City; Rush Medical College, Chicago, 1917; served during the World War; on the staff of the Veterans Administration Facility; aged 57; died, April 16, of chronic nephritis.

Arnold Burkelman, Los Angeles; Bellevue Hospital Medical College, New York, 1891; member of the California Medical Association and the Pacific Coast Oto-Ophthalmological Society; aged 76; died, April 23.

Samuel Wray Alexander, McKenzie, Tenn.; University of Tennessee College of Medicine, Memphis, 1933; member of the Tennessee State Medical Association; aged 36; died, April 9, of coronary thrombosis.

George Andrew Rigrish, Charleston, W. Va.; Medical College of Ohio, Cincinnati, 1896; member of the West Virginia State Medical Association; aged 69; died, April 7, in the Kanawha Valley Hospital.

David Oswald Foley ● Mount Jackson, Va.; University of Maryland School of Medicine, Baltimore, 1896; aged 69; died, April 24, in the Rockingham Memorial Hospital, Harrisonburg, of angina pectoris.

Curtis Lewis Hancock, Lexington, Ky.; Hospital College of Medicine, Louisville, 1904; served during the World War; on the staff of the Veterans Administration; aged 57; died, April 20, of heart disease.

Frank Herbert Low, Santa Monica, Calif.; University of Pennsylvania School of Medicine, Philadelphia, 1929; member of the Utah State Medical Association; aged 44; died, March 30, in Salt Lake City.

Annie Luverne Harris, Richmond, Maine; Vanderbilt University School of Medicine, Nashville, Tenn., 1930; member of the Maine Medical Association; aged 38; was found murdered in March.

De Forrest Elmer Tiffany, San Jose, Calif.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1893; member of the California Medical Association; aged 69; died, March 31.

Edgar Bond Armstrong, New York; Columbia University College of Physicians and Surgeons, New York, 1905; member of the Medical Society of the State of New York; aged 59; died, April 20.

David De Will Moncrief, Atlanta, Ga.; Hospital Medical College, Atlanta, 1911; served during the World War; medical examiner of the Civil Aeronautics Administration; aged 64; died, April 11.

Joseph Luther Ewing, Shreveport, La.; Memphis (Tenn.) Hospital Medical College, 1911; member of the Louisiana State Medical Society; served during the World War; aged 54; died, March 28.

Frank Rudd McDonald ✪ Jersey City, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1917; served during the World War; aged 52; died, April 2, of coronary occlusion.

R. A. Creekmore, Calhoun City, Miss.; Louisville (Ky.) Medical College, 1894; Memphis (Tenn.) Hospital Medical College, 1895; aged 67; died, April 15, in the Baptist Hospital, Memphis.

Robert Washington King, Ackmen, Colo.; University of Colorado School of Medicine, Denver, 1912; aged 70; died, April 16, of coronary occlusion, arthritis, gangrene and acute nephritis.

J. Louis Fichman, Indianapolis; Indiana University School of Medicine, Indianapolis, 1929; member of the Indiana State Medical Association; aged 35; died, March 29, in the Methodist Hospital.

John Vassie Brown, Orillia, Ont., Canada; University of Toronto Faculty of Medicine, 1903; served during the World War; aged 64; died, April 8, in the Christie Street Hospital, Toronto.

John James Smith, Paris, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1879; Jefferson Medical College of Philadelphia, 1891; aged 87; died, April 4, of myocarditis.

Benjamin Damsky ✪ New York; Fordham University School of Medicine, New York, 1917; on the staff of the Mount Sinai Hospital; aged 48; died, April 24, of coronary occlusion.

Noah Gorsuch, Sunbury, Ohio; Columbus Medical College, 1892; member of the Ohio State Medical Association; aged 80; died, March 31, in the White Cross Hospital, Columbus.

John M. McClanahan, Guilford, Mo.; Missouri Medical College, St. Louis, 1886; aged 81; died, April 9, of valvular heart disease, diabetes mellitus and hypertrophy of the prostate.

George L. Perry, Portland, Ind.; Medical College of Indiana, Indianapolis, 1897; formerly county coroner and deputy coroner; aged 72; died, April 5, in the Jay County Hospital.

George Washington Heriot Jr., Roberta, Ga.; University of Georgia Medical Department, Augusta, 1928; aged 37; died, April 4, in Savannah of accidental morphine poisoning.

Charles Kahn ✪ Chicago; Northwestern University Medical School, Chicago, 1897; on the staff of the Englewood Hospital; aged 66; died, April 9, of coronary thrombosis.

William Francis Dryden, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; aged 69; died, March 29.

Edward O. Woodward, Martinsville, Va.; Meharry Medical College, Nashville, Tenn., 1897; aged 75; died, April 5, of acute pyelitis and carcinoma of the prostate.

Thomas Leo Mahony, Poughkeepsie, N. Y.; Long Island College Hospital, Brooklyn, 1907; aged 60; died, April 15, in the St. Francis Hospital of carcinoma.

Isaac Hall Emison, Russellville, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; aged 86; died, March 29, in San Antonio, Texas.

Laura Willis Cook Hann, Washington, N. J.; Woman's Medical College of Baltimore, 1892; aged 81; died, April 13, in Trenton, of cerebral arteriosclerosis.

Edward Thomas Kennedy ✪ Chicago; College of Medicine and Surgery, Chicago, 1905; aged 61; died, April 11, in the Edgewater Hospital of pneumonia.

Frank Means Johnston ✪ Tuskegee, Ala.; University of the South Medical Department, Sewanee, Tenn., 1900; aged 63; died, April 3, of cerebral hemorrhage.

W. E. Lebo, Gratz, Pa.; Medico-Chirurgical College of Philadelphia, 1897; aged 66; died, April 14, in the Harrisburg (Pa.) Hospital of nephrosclerosis.

John Moore Taylor ✪ Indianapolis; Indiana University School of Medicine, Indianapolis, 1921; aged 50; died, April 12, of a self-inflicted bullet wound.

William Andrew Haggard ✪ Miami, Fla.; University of Alabama School of Medicine, University, 1911; aged 56; died, April 3, of coronary sclerosis.

Fred Ernest Davis, Alvordton, Ohio; Toledo Medical College, 1904; formerly mayor of Alvordton; aged 70; died, April 14, of arteriosclerosis.

Henry James Millstone, Chicago; Rush Medical College, Chicago, 1916; aged 48; died, April 17, of an overdose of a drug, self administered.

Arlander Alonzo Barge, Newnan, Ga.; Atlanta Medical College, 1891; member of the Medical Association of Georgia; aged 80; died in April.

Tip Cox, Arabi, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; aged 61; died, April 4, of cerebral hemorrhage.

Harry Barton Hinchman ✪ Richmond, Va.; Medical College of Virginia, Richmond, 1916; aged 51; died, April 7, of coronary thrombosis.

William Monroe Edens, Estill Springs, Tenn.; University of Tennessee Medical Department, Nashville, 1890; aged 81; died, March 19.

Fred W. Cariker, Cushing, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1893; aged 69; died, April 16.

Samuel A. McConkey, Barboursville, W. Va.; Medical College of Virginia, Richmond, 1891; aged 76; died, April 8, of pneumonia.

Homer E. Songer, Kansas City, Mo.; Barnes Medical College, St. Louis, 1901; aged 65; died, April 1, of bronchopneumonia.

Ambert Young Easterwood, Ardmore, Okla.; University of Texas School of Medicine, Galveston, 1897; aged 69; died in March.

Percy C. Banghart, London, Ont., Canada; Western University Faculty of Medicine, London, 1905; aged 57; died, April 6.

Charles G. Holland, Greenville, Fla.; Louisville (Ky.) Medical College, 1891; aged 80; died, April 22, of diabetes mellitus.

Franklin English Michener, Tiffin, Ohio; Ohio Medical University, Columbus, 1898; aged 83; died, April 6, of angina pectoris.

George Noble Couch, Latham, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1906; aged 65; died, April 7.

Robert Blake Tyler, Joplin, Mo.; Joplin College of Physicians and Surgeons, 1882; Civil War veteran; aged 87; died, April 2.

Margaret Doane Bigelow, Cincinnati; Laura Memorial Woman's Medical College, Cincinnati, 1899; aged 68; died in April.

Charles H. Beetem, Baltimore; Maryland Medical College, Baltimore, 1900; aged 71; died, April 13, of chronic nephritis.

Homer V. Hickman, Olney, Ill.; Barnes Medical College, St. Louis, 1901; aged 72; died, April 17, of bronchial asthma.

Eli Lewison, Canton, S. D.; Rush Medical College, Chicago, 1902; aged 66; died, April 6, of bronchopneumonia.

Austin R. Allen, Denver; Missouri Medical College, St. Louis, 1878; aged 84; died, April 9, of arteriosclerosis.

Henry F. Rhodes, Philadelphia, Mo.; Jefferson Medical College of Philadelphia, 1883; aged 82; died, April 5.

Harry B. Andrew ✪ New Salem, Ill.; Missouri Medical College, St. Louis, 1896; aged 68; died, April 5.

Julian Howard Herndon, Miles, Texas; Louisville (Ky.) Medical College, 1904; aged 63; died, April 16.

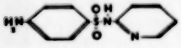
James E. Wyatt, Prairie Point, Miss.; Louisville (Ky.) Medical College, 1883; aged 85; died, March 17.

Gaetano Ronga, Chicago (licensed in Illinois in 1899); aged 66; died, April 6.

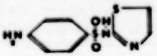
Correspondence

STRUCTURAL RELATIONSHIPS OF SULFAPYRIDINE AND SULFATHIAZOLE

To the Editor:—An explanation for the efficacy of sulfapyridine and sulfathiazole which I have not seen in print is suggested by an examination of their structural formulas:



Sulfapyridine.



Sulfathiazole.

Now, sulfapyridine differs from the parent sulfanilamide by having a pyridine nucleus attached to the amido group. This pyridine nucleus is present in the quinoline alkaloids, such as quinine, and also in the synthetic ethyl hydrocupreine hydrochloride. These are toxic to pneumococci, and the effectiveness of sulfapyridine may possibly be due in some measure to the added pyridine nucleus.

If sulfur is substituted for an ethylene linkage in a cyclic compound, the properties are not changed much. Thus, thiophene and benzene have properties so close that it is very difficult to separate them. In the same fashion, thiazole differs little from pyridine in chemical and physical properties.

Thus, one would expect sulfathiazole to have about the same chemical properties, and therefore pharmacologic action, as sulfapyridine. It is known (Fränkel, Sigmund: Arzneimittelsynthese, ed. 5, Berlin, Julius Springer, 1921, p. 109) that the presence of cyclically bound sulfur in a compound exerts a "resorptive" effect similar to that of the iodides, and in a disease such as pneumonia, which is characterized by a strong exudative process, it may be that sulfathiazole exerts a beneficial effect by stimulating the resorption of the exudate.

This reasoning is by no means rigorous, but it does suggest lines of investigation with these new drugs.

EMANUEL M. ABRAHAMSON, M.D., Brooklyn.

MEDICAL FAMILIES

To the Editor:—I noticed in THE JOURNAL, May 3, page 2102, a short report from Dr. J. P. Sharon about a medical family that he knew, with their names and relationships. Although some of them are dentists, there are a number of M.D.'s among them. This report aroused my interest enough to enclose the bookplate that I had designed for my son's graduation in 1938 at Johns Hopkins. He is the seventh doctor in my family, all of whom have practiced in Baltimore in an unbroken line. He is the fourth Ferdinand. I have all the diplomas of my forebears, including those of my uncle S. M. C. and of my brother F. E. C. III, who did not live long enough to practice but died a month after graduation. My uncle after starting in medicine went into the priesthood and later became the Bishop of Indianapolis.

The reason I have Haiti on the bookplate is that the family was driven out at the time of the insurrection and settled in Baltimore.

J. A. CHATARD, M.D., Baltimore.

VARICELLA AND HERPES ZOSTER

To the Editor:—In the discussion of the relationship of varicella to herpes zoster, so much importance has been in the past attached to the report of Cantor (*Brit. M. J.* **2**:508, 1921) on the complete absence of varicella from a small island in the Straits Settlements on which zoster not uncommonly occurred that the following letter is of scientific as well as historical interest:

Christmas Island
Straits Settlements
April 3, 1941

Dear Dr. Rosenberg:

Replying to your letter of January 20, 1941, I am afraid Christmas Island lost its only claim to distinction in 1933 when 4 people, all old residents on the island, were diagnosed as suffering from varicella. Again in 1940 there was 1 case. With regards to herpes zoster, I can only find 1 case recorded. This occurred in 1936.

Trusting this information will be satisfactory,

Yours very truly,

J. SCOTT CLARK, M.B., Ch.B.,
Medical Officer, Christmas Island
Phosphate Company, Ltd.

JACOB ROSENBERG, M.D., Brooklyn.

THIAMINE OVERDOSAGE

To the Editor:—In a communication on thiamine overdosage and toxicity in THE JOURNAL, May 3, Dr. Clarence A. Mills, professor of experimental medicine of the University of Cincinnati College of Medicine, stressed the importance of the recognition of symptoms of overdosage of thiamine and the possible danger of the addition of thiamine hydrochloride to bread and other commonly used foods without control over the intake level. He wrote: "Just why no reports of thiamine toxicity have appeared in medical literature is difficult to understand, for the vitamin has been widely used at daily intake levels of 10 to 50 mg. in treatment of deficiency states." I called attention to the untoward effects resulting from the use of continuous and large doses of thiamine as early as December 1938 in the *American Journal of Digestive Diseases.* The importance of irritation of the peripheral nerves resulting in herpetiform lesions was described.

CHARLES LEROY STEINBERG, M.D., Rochester, N. Y.

TRANSFUSION OF PLASMA

To the Editor:—Transfusion either of whole or of modified blood is a widely used and highly successful therapeutic procedure. It is therefore important that any attendant catastrophe be most carefully analyzed. For this reason I wish to call attention to some errors contained in the report "Death from Transfusion of Plasma" by Dr. Frank Mayner, Wyandotte, Mich. (THE JOURNAL, May 3, p. 2015).

The subject of this report was in my service in the Wyandotte General Hospital. I also cared for his elder brother when he was hospitalized with the same illness. Contrary to the statement in the report, the elder brother recovered and today is alive and well.

The statement that the patient had been given a transfusion of whole blood is also in error. The patient had had no transfusion before the plasma transfusion that was given immediately prior to his death. Therefore there could have been no question of an induced sensitivity because of a previous transfusion.

This case record and the section of lung kindly lent by Dr. Mayner have been reviewed by Dr. Warren B. Cooksey of Detroit with Dr. Armand Quick of Milwaukee and Dr. Max Strumia of Bryn Mawr, Pa. They reached the conclusion that the emboli of fibrin found only in the capillary system of the lungs came preformed from the donor's unfiltered plasma rather than having been formed after this plasma was introduced into the recipient's circulatory system.

It is well known that properly prepared plasma on standing may coagulate and form minute masses of fibrin which are potential emboli. It follows that all plasma before being administered intravenously should be filtered. This was not done in the case under discussion and undoubtedly accounts for the presence of fibrin plugs demonstrated only in the lesser circulation.

J. Hugh Lewis, M.D., Wyandotte, Mich.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in The Journal, June 7, page 2618.

NATIONAL BOARD OF MEDICAL EXAMINERS

National Board of Medical Examiners: Parts I and II. Various centers, June 23-25. Part III. Various centers, June or July. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

American Board of Anesthesiology: *Written. Part I.* Various centers, Nov. 1. Final date for filing application is Aug. 4. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

American Board of Dermatology and Syphilology: *Written.* Nov. 3. Final date for filing application is Sept. 23. *Oral.* Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

American Board of Internal Medicine: *Written.* Oct 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

American Board of Obstetrics and Gynecology: *Written. Part I. Group B.* Jan 3. *Oral. Part II. Groups A and B.* Atlantic City, May or June. Final date for filing application is 90 days in advance of the examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

American Board of Ophthalmology: *Oral.* Portland, July 15; Chicago, Oct. 18. *Written.* March 7, 1942. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

American Board of Orthopaedic Surgery: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 1640 State St., New Orleans, La.

American Board of Otolaryngology: Chicago, Oct. 16-18. Final date for filing application is July 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

American Board of Pediatrics: *Oral.* Boston, Oct. 7-8, immediately following the annual meeting of the American Academy of Pediatrics. *Written.* Locally, Aug. 22. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

American Board of Psychiatry and Neurology: *Oral.* New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

American Board of Radiology: *Oral. All groups.* Cincinnati, Sept. 19-21. Final date for filing application is Aug. 1. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., S. W., Rochester, Minn.

American Board of Urology: Chicago, February. Final date for filing application is three months before date of examination. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Hawaii January Report

The Board of Medical Examiners of the Territory of Hawaii reports the written examination for medical licensure held at Honolulu, Jan. 13-16, 1941. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Six candidates were examined, 5 of whom passed and 1 failed. Two physicians were licensed to practice medicine by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine		(1939)	78
University of Illinois College of Medicine		(1939)	91
Tulane University of Louisiana School of Medicine		(1939)	77.4
Cornell University Medical College		(1939)	86
University of Oregon Medical School		(1939)	80

School	FAILED	Year Grad.
Creighton University School of Medicine		(1936)

School	LICENSED BY ENDORSEMENT	Year Grad.
Harvard Medical School		(1937)
Vanderbilt University School of Medicine		(1931)

Colorado April Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure held at Denver, April 2-4, 1941. The examination covered 8 subjects and included 68 questions. An average of 75 per cent was required to pass. Five candidates were examined, all of whom passed. Two physicians were licensed to practice medicine by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine		(1941)	82
Northwestern University Medical School		(1941)	87.8
Rush Medical College		(1939)	80.5
University of Oklahoma School of Medicine		(1940)	86
University of Wisconsin Medical School		(1940)	89.8

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Kansas School of Medicine		(1934)	Kansas
University of Nebraska College of Medicine		(1934)	Nebraska

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Liability of Physician for Patient's Injury from Fall in Treatment Room.—The defendant physician treated the plaintiff in his office, the treatment consisting of the application of a phenol solution to the cervix of the uterus. On completion of the treatment he told her, according to his testimony, to remain on the treatment table until she felt all right. He then left the room. The patient apparently immediately got off the table, became nauseated, fainted and fell against a hot radiator, sustaining a burn. In a subsequent suit against the physician and the corporation that owned the building in which the physician's office was located, the patient contended that the physician was negligent in permitting her to remain unattended following the treatment, in keeping the treatment room extremely hot and in leaving the radiator unprotected. At the close of the plaintiff's evidence, the trial court dismissed the case and the plaintiff appealed to the Supreme Court of Washington.

With respect to the corporate owner of the building, the Supreme Court said that its stock was held primarily by physicians having offices in the building and that the defendant physician owned some twenty-two shares of the corporation's five hundred shares. The defendant paid rent as a tenant to the corporation but the corporation in no way shared in his earnings. Clearly, the court said, the plaintiff made no case against the corporation and the judgment of dismissal as to it was proper.

The defendant physician, called as an adverse witness by the plaintiff, testified that in most physicians' offices in the locality the radiators used to heat them were not protected by a covering and that the treatment table used at the time of the accident was of the type customarily used. He estimated that the temperature of the room at the time of the plaintiff's treatment was between 75 and 80 F., explaining that the room was customarily kept quite warm because of the fact that many of the patients remove their clothing before undergoing treatment. He further testified that the treatment room and its equipment was of the type customarily used in the average physician's office in the community and that the treatment administered to the plaintiff was quite common and that there was nothing about it that the average physician considered as likely to cause a patient to faint. He further said that ordinarily a nurse would not remain in the room after the treatment was administered.

It was the opinion of the Supreme Court that negligence cannot be predicated on the manner in which the treatment room was equipped nor on the presence of the hot radiator. The immediate cause of the accident was the fainting of the patient; the presence of the radiator was but a condition. Falling in a faint, the patient might have sustained injuries in other ways,

by striking her head on the floor or against some other object in the room. Since negligence is not to be presumed, the question resolved itself into whether the evidence produced by the plaintiff, in itself, or in the reasonable inference to be drawn from it, would warrant a finding of negligence by the jury predicated on the defendant's failure to have some one in attendance on the patient after administration of the treatment. The plaintiff in her complaint set out the standard by which the defendant's professional conduct was to be measured, namely "the usual practice in like cases in this locality and similar communities." Other than the testimony of the defendant, however, the plaintiff produced no evidence whatever as to what was the usual practice in like cases in the locality. The trial court dismissed the case on the ground that, in the absence of the testimony of qualified practitioners, the jury could only speculate as to what the defendant should have done under the circumstances. The plaintiff produced neither medical nor lay testimony on this issue and the Supreme Court felt that the trial court was justified in dimissing the case. The judgment of dismissal was therefore affirmed.—*Hoover v. Goss et al, 97 P. (2d) 689 (Wash., 1940).*

Medical Practice Acts: Constitutionality Not Affected by Exemption of Faith Healers.—Max A. Vogel, a naturopath, was convicted of violating the medical practice act of Texas and appealed to the court of criminal appeals of Texas. While he had no license to practice medicine, Vogel possessed a "certificate" issued by the Naturopathic Association of Texas, a corporation, which at one time was filed for record with the clerk of the county court of Bexar County, Texas. The registration of that certificate, however, was canceled by court order in July 1937.

During the argument to the jury in the present case the district attorney stated that the defendant should have known that he was required to have a license to practice medicine because many members of the Naturopathic Association of Texas had had their registered certificates eliminated from the records in a court action brought by the attorney general. At the time that this statement was made, the district attorney held in his hand a medical register, many sheets of which had not been offered in evidence. The defendant contended that this argument was improper because it had no support in the evidence. The record showed, however, that there had been introduced in evidence, without objection from the defendant, a petition against the district clerk of Bexar County praying that he be ordered to strike from the records of his office the naturopathic certificates. It was further shown that the prayer was granted and that the registration of defendant was among those eliminated from the medical register. In view of that evidence, the court thought that the argument of the district attorney was warranted and proper.

The court likewise overruled the defendant's contention that the medical practice act, by exempting from its terms those applying the "principles, tenets, or teachings of any church in ministering to the sick or suffering by prayer, without the use of any drug or material remedy," was discriminatory and therefore unconstitutional. The court could find no reversible error in the record and the judgment of conviction was affirmed.—*Vogel v. State, 137 S. W. (2d) 1043 (Texas, 1940).*

Advertising Baker's "Cancer Cure" by Mail Constitutes Use of Mails to Defraud.—In 1929 Norman Baker, who at that time was a grocery merchant, learned that a Dr. Ozias in Kansas City had discovered a hypodermic treatment reputed to cure patients suffering from cancer. Baker selected 5 test patients who had cancer and sent them to Dr. Ozias for treatment. After these patients had been treated by Dr. Ozias, Baker announced over a radio station which he owned and in a magazine which he published that a cure for cancer had been discovered. All the test patients subsequently died from cancer, but Baker continued to advertise, by means of radio, magazines, letters, pamphlets and the like, the false claim that he had discovered and perfected a sure cure for that disease. "Dr. Ozias did not give Baker his formula for treatment of cancer, but two persons in his employ went to work for Baker." In the advertisements disseminated by Baker and his associates Bellows and Statler, persons suffering from cancer, including those in the last stages of the disease, were urged to visit either the Baker Hospital at Eureka Springs, Ark., or the Baker Institute at Muscatine, Iowa. They promised that the period of treatment at these institutions was short and the fee small, and if the patient was not cured on his first visit he would be given further treatments free of charge. Their propaganda also contained the statement that surgical operations, roentgen and radium treatments and all other remedies and treatments recommended by members of the American Medical Association would not and could not in any event cure cancer but that Baker had discovered and perfected "a sure cure" for the disease. They claimed that many persons who had been given up to die by members of the regular medical profession had been cured of cancer by Baker's method. Baker and his associates were subsequently indicted for violation of the United States postal laws (U. S. Criminal Code, Section 215; 18 U. S. C. A., Section 338) in that they used the United States mails in the perpetration of a scheme to defraud and to obtain money and property by means of false pretenses and representations. The defendant Baker did not testify in his own behalf. From a judgment of conviction the defendants appealed to the United States circuit court of appeals, eighth circuit.

The defendants first contended that the indictment under which they were convicted was insufficient because it failed to allege that any person induced to visit the Baker hospitals was also induced by fraud to part with some money or property of value. The circuit court of appeals held that the gist of the defendants' offense was the use of the mails to defraud and that it was quite immaterial whether the scheme was successful or unsuccessful. The defendants also contended that the letters and other material, including a package of salve, mailed by them did not carry out the fraudulent scheme. The court, however, held that these letters, which referred to the treatments performed or advised by the defendants and contained statements promoting the Baker hospitals and the Baker "cure," had such a relation to the fraudulent scheme as to aid in its execution.

The court could not agree with the defendants' contention that the trial court had erred in refusing to receive in evidence three reels of motion pictures purporting to show the treatment and progress of patients in the Baker hospitals. These pictures, said the court, were properly excluded because no proper foundation had been laid for their admission and there was nothing in them which could not have been better proved by oral testimony.

The defendants further contended that the evidence was insufficient to sustain the verdict of guilty. They admitted that they had advertised that treatment by the use of surgery, roentgen rays and radium and other methods of treatment recommended and used by members of the Americal Medical Association would not and could not in any event cure cancer and that Baker's method was "a sure cure" for that disease, but they insisted that such statement was at best a mere matter of opinion. There was, said the court, substantial evidence by eminent experts that the proper method of treating cancer is by the use of surgery, roentgen rays and radium. Conceding that the defendants could honestly have entertained an opinion as to the efficiency of some or all of the methods of treating cancer, the falsity of the defendants' statement appears from the use of the supposedly fair difference of opinion as a step in assuring the public that in contrast Baker had discovered and perfected "a sure cure" for cancer. While there may be an honest difference of opinion as to the value and efficacy of the use of a certain medicine or a certain curative practice, what is advanced as a difference of opinion cannot be used as a device to deceive or as a step so wanting in basis that it must be denounced as a fraudulent misrepresentation. The

court could not agree with the defendants' insistence that there was no proof that fake examinations had been made at the Baker hospitals as was charged in the indictment. According to the evidence, continued the court, many patients were admitted but many received only superficial treatment at best. An untrained or practical nurse gave treatments consisting of colonic and vaginal packs which should be given only by or under the direction of a physician. There were no microscopes in the hospitals and no pathologic examination or study was attempted. A physician who had been employed at the Baker hospital testified that there was no way of determining for certain whether or not patients had cancer. The chief of staff at the Baker Hospital, Beatty, testified that he detected cancer by "palpation, feeling of it and guessing whether the patient had it or not." One of the defendants, Statler, testified that he "judged cancer from looking at the patient." There was also evidence that the examination of patients consisted of "pinching them and looking at them." Two eclectic physicians who had been employed at one or the other of the Baker hospitals for various periods between 1937 and 1938 testified that they had given the same hypodermic injections, numbers 4 and 5, to all patients but that they did not know the composition of the solutions injected. According to the evidence, injection number 4 contained hydrochloric acid 0.18 of 1 per cent, salt 0.03 per cent, a trace of phosphate and the rest water, while injection number 5 contained glycerin 25.53 per cent, carbolic acid 28.4 per cent and the balance alcohol. Eminent experts testified that the remedies used by the defendants "would not effect a cure for cancer nor do any good to anything." The circuit court of appeals concluded, therefore, that there was abundant evidence of the defendants' lack of good faith. The court also believed that the conduct of the district attorney in making certain remarks about one of defendants' witnesses was unethical and reprehensible but not prejudicial, as the defendants contended. Accordingly, the circuit court of appeals affirmed the judgment of conviction. Defendants' petitions for a writ of certiorari and for a rehearing were denied by the United States Supreme Court.—*Baker et al. v. United States, 115 F. (2d) 533 (1940); 61 S. Ct. 711 (1941); 61 S. Ct. 731 (1941).*

Hospitals, Governmental: Right to Exclude Osteopaths.—By a special act of the Florida legislature, the city commissioners of Miami were authorized to establish and operate the Jackson Memorial Hospital and to create a board of trustees for the management of the institution. Pursuant to its power to establish by-laws, rules and regulations, the board adopted a rule providing that only legally licensed physicians who were graduates of class A medical schools, with an M.D. degree and eligible for membership in the Dade County Medical Association should be admitted to practice in the hospital. As a result of the enforcement of this rule the plaintiff, an osteopath, was denied the privilege of entering the hospital and caring for one of his patients. He thereupon petitioned the circuit court, Dade County, for an order to restrain the enforcement of the board's rule. From a judgment against him, the plaintiff appealed to the Supreme Court of Florida.

The plaintiff first contended that an osteopath has a constitutional right to practice his profession in a tax-supported institution and that the rule denying that right was therefore unconstitutional and discriminatory. The Supreme Court held that this contention had already been disposed of in two prior cases the facts of which were substantially the same as in this case. In the first of these, *Hayman v. City of Galveston*, 273 U. S. 414, 47 S. Ct. 363 (J. A. M. A. **89**:234 [July 16] 1927), the Supreme Court of the United States said that some choice in methods of treatment in a hospital was inevitable and that it was neither unreasonable nor arbitrary to exclude the devotees of some of the numerous systems or methods of treatment of the sick. Furthermore, said the United States Supreme Court, no practitioner has a constitutional right to practice his profession in a publicly supported institution. A state is not required to maintain a hospital for the private practice of medicine. In the other case, *Newton v. Board of Commissioners of Weld County*, 86 Colo. 446, 282 P. 1068 (J. A. M. A. **95**:366 [Aug. 2] 1929), the Supreme Court of Colorado similarly held that "a regulation excluding from the county hospital, or the right to practice therein, the devotees of some of the numerous systems or methods of treating diseases authorized to practice the profession in Colorado is neither unreasonable nor arbitrary. Some choice of methods necessarily exists, and we cannot say that in the case at bar the county board of commissioners did not have an adequate basis for its resolution. Neither can we say that this resolution was not justified upon the ground, which abundantly appears from this record, that, if the right to practice in the county hospitals is open to all the different schools of medicine, there would be constant jealousies and dissatisfaction between the rival schools of medicine which probably might or would greatly lessen the usefulness of the public hospital. The court cannot substitute its judgment for that of the county board. . . ."

The plaintiff further contended that the Florida osteopathic practice act clearly disclosed a legislative intent that osteopaths and doctors of medicine should have equal rights and privileges so far as public institutions were concerned, referring particularly to section 13 of that act which provides that "Osteopathic Physicians and Surgeons licensed hereunder shall have the same rights as physicians and surgeons of other schools of medicine with respect to the treatment of cases or holding of offices in public institutions." In answering this contention the court said, in part:

> We encounter but little, if any, difficulty in construing Chapter 12287 [the osteopathic act]. We find the intention of the Legislature free from doubt and the object to be accomplished in its enactment is free from ambiguity. The expression "treatment of cases" is an authority, right and privilege granted to osteopathic physicians and surgeons, after completing the course of study prescribed by law and successfully passing the prescribed examination, and by the Board of Osteopathic Medical Examiners granted a license to practice as set forth in Section 11 of the Act.
>
> The expression in the Act that osteopathic physicians and surgeons licensed thereunder shall have the same rights as physicians and surgeons of other schools of medicine with respect to the treatment of cases or "holding of offices in public institutions" cannot be construed to mean that patients of osteopathic physicians can be granted the rights and facilities of municipal hospitals, but the "holding of [public] offices in public institutions" may be construed to mean that osteopathic physicians are legally eligible to hold office in public institutions when appointed or elected. An examination of the title of the Act, as well as the body, considered in its entirety, fails to show a legislative intent to authorize osteopathic physicians and surgeons to practice in or have all the rights and facilities of a municipal hospital extended as a matter of law to their patients. The Act as a whole is applicable to osteopathic medicine; it provides for a course of study and a Board whose duty it is to hold examinations and license those eligible to practice. We are unable to read into the Act the contentions here made on the part of counsel for appellant that osteopathic physicians can practice in and have the right and facilities of a municipal hospital extended to their patients.

The judgment of the trial court denying to the osteopath the relief sought was affirmed.—*Richardson v. City of Miami et al., 198 So. 51 (Fla. 1940).*

Society Proceedings

COMING MEETINGS

American Association on Mental Deficiency, Salt Lake City, June 20-24. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Laryngological, Rhinological and Otological Society, Los Angeles, June 16-18. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.

Idaho State Medical Association, Sun Valley, June 18-21. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.

Maine Medical Association, York Harbor, June 22-24. Dr. Frederick R. Carter, 22 Arsenal St., Portland, Secretary.

Montana, Medical Association of, Great Falls, June 24-26. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.

Pacific Northwest Medical Association, Spokane, Wash., June 25-28. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Physiology, Baltimore

132:311-570 (March) 1941. **Partial Index**

Coronary Reflex Dilatations Accompanying Contractions of Voluntary Muscles. C. W. Greene.—p. 321.
Presence and Distribution of Histamine in Blood. D. Minard, Chicago. —p. 327.
Biochemical Characteristics of Denervated Skeletal Muscle, at Rest and After Direct Stimulation. R. Levine, O. Hechter and S. Soskin, Chicago.—p. 336.
Magnitude and Time of Development of Collateral Circulation in Occluded Femoral, Carotid and Coronary Arteries. R. W. Eckstein, D. E. Gregg and W. H. Pritchard, Cleveland.—p. 351.
Pattern of Serum Proteins During Accelerated Growth. E. S. Zawadski and A. H. Smith, Detroit.—p. 362.
Effect of Bile Acids on Hepatic Blood Flow. F. S. Grodins, S. L. Osborne, A. C. Ivy and L. Goldman, Chicago.—p. 375.
Training in Human Muscles Working With and Without Blood Supply. G. L. Maison and A. G. Broeker, St. Louis.—p. 390.
Relationship of Plasma Volume and Cell Plasma Ratio to Total Red Cell Volume. E. A. Stead Jr. and R. V. Ebert, Boston.—p. 411.
Effect of Hypoxemia on Ventilation and Circulation in Man. E. Asmussen and H. Chiodi, Boston.—p. 426.
Comparative Effects of Progesterone and Corticoadrenal Extracts on Normal, Adrenalectomized and Other Animals. E. L. Corey, with technical assistance of R. Kline, Charlottesville, Va.—p. 446.
Measurement of Blood Flow of Liver. J. H. Grindlay, J. F. Herrick and F. C. Mann, Rochester, Minn.—p. 489.
Observations on Water Intake in Adult Man with Dysfunctioning Salivary Glands. F. R. Steggerda, Urbana, Ill.—p. 517.
Circulation in Rest and Work on Mount Evans (4,300 Meters). E. Asmussen and F. C. Consolazio, Boston.—p. 555.

American Journal of Surgery, New York

51:553-852 (March) 1941. **Partial Index**

Treatment of Fresh Wounds. P. H. Kreuscher, Chicago.—p. 573.
*Use of Bipp and Liquid Paraffin in Treatment of Wounds. F. B. Gurd and Laurie H. McKim, Montreal.—p. 584.
Fifteen Years of Tannic Acid Method of Burn Treatment. D. M. Glover and A. F. Sydow, Cleveland.—p. 601.
Traction Paralysis of Brachial Plexus. A. Kolodny, New York.—p. 620.
Diagnosis and Treatment of Post-Traumatic Osteoporosis. L. G. Herrmann and J. A. Caldwell, Cincinnati.—p. 630.
*Possible Etiologic Relationship Between Single Trauma and Malignant Tumor. H. H. Davis, Omaha.—p. 641.
Preservation of Tendon Function by Use of Skin Flaps. E. A. Kitlowski, Baltimore.—p. 653.
Avulsion of Lower Biceps Brachii Tendon: Analysis of Fifty-One Previously Unreported Cases. R. P. Dobbie, Buffalo.—p. 662.
Pathologic Changes Induced in Tendons Through Trauma and Their Accompanying Clinical Phenomena. N. J. Howard, San Francisco.—p. 689.
Some Observations on Fractures of Long Bones in Children. F. Beckman and J. E. Sullivan, New York.—p. 722.
Low Back Pain and Trauma. H. E. Mock, Chicago.—p. 779.
Our Changing Ideas Concerning Protrusion of Intervertebral Disks. J. Raaf, Portland, Ore.—p. 803.
Compatibility Factor in Transfusion of Blood. A. L. Cameron, Minot, N. D.—p. 821.
Severe Injuries of Face and Jaws. E. C. Padgett, Kansas City, Mo.—p. 829.

Bismuth Paste and Liquid Petrolatum for Wounds.—Gurd and McKim point out that the bismuth iodoform petrolatum paste (bipp) method of treating wounds is again gaining importance. After twenty-three years of use they are convinced that the method may be safely and effectively used for the following types of wounds: 1. Acute traumatic lesions whether due to gunshot wounds, automobile injuries or construction accidents associated with potential infection and particularly with compound fractures. In less severe wounds a complete primary closure may be done occasionally. However, a delayed primary closure is nearly always advisable. When loss of tissue is so extensive so that delayed primary suture is impossible, or when moderate infection exists, secondary suture or various plastic procedures for filling the defects may be utilized. 2. Infected wounds which may have resulted from untreated trauma or infection of operating wounds. The method is also efficacious as a prophylactic measure against infection of the wall of the body when certain infected cavities (abdominal, appendical or pulmonary abscesses, empyema and operations on the mastoid or other deep seated abscesses) are opened. The bismuth iodoform petrolatum paste method is similar (mechanical cleansing, application of an antiseptic and immobilization) to the Winnett-Orr method. However, it differs in that the iodine as used by Orr will be absorbed in a short time and no further supply will be available, but the use of bipp results in a continuous supply of nascent iodine to the tissues as long as the paste is present in the wound. The material inhibits bacterial growth and liberates small amounts of iodine over a long period. The paste is composed of one part of bismuth subnitrate with two parts of iodoform (powder) and sufficient liquid petrolatum to form a paste.

Single Trauma and Malignant Tumor.—Davis states that a single injury to previously healthy tissue has never been definitely proved to cause cancer, but a single trauma may reveal a malignant growth. No one has succeeded in experimentally producing malignant tumors by trauma alone. The element of chance may account for the incidence of trauma in a few cases in which cancer developed. The general impression of those who have studied large numbers of injured people (war injuries) is that there is no increase of cancer among them in comparison to those who have not sustained single injuries. In individual instances it may not be possible to disprove absolutely the etiologic relationship. To consider trauma as a cause, the following must be fufilled: (1) the authenticity of the trauma, (2) the adequacy of the trauma, (3) the origin of the tumor at the injury, (4) the previous integrity of the injured part, (5) a reasonable time limit between the injury and the appearance of the tumor and (6) the positive diagnosis of the presence and type of the tumor.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

25:133-264 (March) 1941

Blood Cells in Early Syphilis. U. J. Wile, R. Isaacs and C. W. Knerler, Ann Arbor, Mich.—p. 133.
Modern Possibilities of Gonorrhea Control. R. Deakin and M. Wortman, St. Louis.—p. 142.
Effect of Temperature on Kahn Reaction: Parts I to IV. R. L. Kahn, E. B. McDermott and S. Marcus, Ann Arbor, Mich.—p. 151.
Possible Presence of Reagin-like Factor in Normal Human Serum. N. P. Sherwood, G. C. Bond and R. I. Canuteson, Lawrence, Kan. —p. 179.
Microscopic Slide Modification of Eagle and Kahn Flocculation Tests for Syphilis. J. H. Strauss, Baltimore.—p. 186.
Etiologic Considerations in Postarsphenamine Dermatitis. F. E. Cormia, Montreal, Canada.—p. 189.
*Reinfection in Congenital Syphilis. R. D. Hahn, Baltimore.—p. 200.
Factors Affecting Results of Contact Investigation in the Syphilis Clinic of the Johns Hopkins Hospital. R. Dyar, Stockton, Calif., and N. W. Guthrie, Los Angeles.—p. 213.
Cutaneous Toxicity of Mapharsen. E. Epstein, Oakland, Calif.—p. 225.
Factors Influencing Course of Syphilis. H. J. Morgan, Nashville, Tenn. —p. 233.

Reinfection in Congenital Syphilis.—Hahn reviews the probable cases of reinfection in congenital syphilis reported in the literature. The review indicates that no definite clinical entity of reinfection in congenital syphilis has been established. In the earlier reports the diagnosis of congenital and acquired infections, of necessity, had to be inferred from clinical appearances alone. More recently workers have conformed to adequate criteria for demonstrating the acquired infection, but for evidence of prior congenital syphilis they contented themselves with the acceptance of more or less ill defined dystrophies or purely anamnestic data. Presumed reinfections in the presence of only more or less vague dystrophies as the sole evidence of congenital syphilis cannot be accepted. The first infection must be proved to be congenital. Second infection is rare in persons with acquired syphilis who have reached the latent stage before treatment is instituted. As the first early congenitally syphilitic persons adequately treated by modern standards are now reaching an age at which the incidence of acquired syphilis is high, search among them for reinfections may yield valuable information. In the files of the Syphilis Clinic of the Johns Hopkins Hospital there are 104 cases of probable or possible reinfection. Only 3 of these represent reinfections in possible congenitally syphilitic patients. One of these first came under observation at the age of 8 years and is not included because the syphilis

may have been acquired early in life. The other 2 cases are reported in detail. The congenital syphilis was adequately treated. They conform to rigid criteria for both the congenital and the acquired infection. There were thirteen years of clinical and serologic negativity, including a negative cerebrospinal fluid, between the first patient's congenital and acquired infection. Although the serologic test for syphilis of the second patient at no time became entirely negative, there were at least eight years of clinical negativity, including a negative cerebrospinal fluid, between the congenital and the acquired infection.

Anesthesiology, New York

2:121-244 (March) 1941

Present Status of the Problem of Preventing Anesthetic Explosions. J. W. Horton, Cambridge, Mass.—p. 121.
Prevention of Cyclopropane-Oxygen Explosions by Dilution with Helium. G. W. Jones and G. J. Thomas, Pittsburgh.—p. 138.
The Hazard of Fire and Explosion in Anesthesia: Report of Clinical Investigation of 230 Cases. B. A. Greene, Brooklyn.—p. 144.
*Anesthesia in Relation to Cardiac Disease. L. C. Reid, New York.—p. 161.
Intravenous Use of Dihydromorphinone Hydrochloride (Dilaudid) for Analgesia. C. J. Betlach, Chicago.—p. 170.
Criteria in Choice of Anesthesia. M. Saklad, Providence, R. I.—p. 172.
Experiment in Recording of Surgical and Anesthetic Data in Military Service: Adaptation of Hollerith Punch Cards, Used at Second Army Maneuvers, 1940. C. P. Wangeman, Madison, Wis.—p. 179.
Influence of Cyclopropane on Peripheral Blood Flow in Man. D. I. Abramson, A. I. Grollman and A. L. Schwartz, Cincinnati.—p. 186.
Stability of Vinyl Ether (Vinethene). J. Adriani, New York.—p. 191.
Regional Anesthesia for Surgery of Thorax and Abdominal Wall. T. H. Seldon, Rochester, Minn.—p. 194.
Nupercaine and Dextrose 1:1,500 Solution for Spinal Anesthesia: Preliminary Report of 450 Cases. B. B. Sankey and R. J. Whitacre, East Cleveland, Ohio.—p. 203.
Subarachnoid Block with Crystalline Pontocaine. W. L. Garth, San Diego, Calif.—p. 205.

Anesthesia in Relation to Heart Disease.—Reid, in discussing the relation of anesthesia to heart disease, confines his remarks to anesthesia and the cellular respiration mechanism, the role of vitamin B, vagovagal reflexes and the climacteric. Cellular respiration is defined as those biologic processes and chemical mechanisms by which the cell converts the bound radiant energy of the sun stored in foodstuff molecules to free, utilizable, biotic energy, thereby making possible cellular activity and existence. Any cardiac lesion which involves either the vascular tree, the myocardium or the specific tissue will lead to a profound disturbance in the production of energy. In such an instance this energy production is still further interfered with by anesthetic agents which inhibit dehydrogenases. This action is probably the principal cause of the hyperglycemia which so often accompanies anesthesia. Many of the failures of carbon dioxide build-up, previously explained on the basis of deficient oxygen intake, are more readily intelligible on the basis of an inhibition of the dehydrogenases. It seems logical to the author to compensate for a decreased efficiency of the cellular oxidation-reduction systems, as a result of the action of anesthetic agents, by an increased oxygen tension through a supplemental oxygen supply. In any event, after the necessity for anesthesia has passed, the earlier the cells are returned to their optimal functional capacity the better. Vitamin B plays a singularly important role in cellular activity, and an adequate amount of this substance is necessary in the diet in heart disease, particularly if anesthesia is contemplated. The respiratory carriers coenzyme I, coenzyme II and flavoprotein are synthesized from the constituents of vitamin B_2. The active functioning part of coenzyme I and coenzyme II is nicotinic acid amide and riboflavin of flavoprotein. Vagovagal reflexes frequently disturb cardiac activity. Vagovagal reflexes might very well give rise to constriction of the coronary arteries with decreased blood supply to the myocardium. These reflexes are important at any time, but particularly so in structurally altered hearts or during light anesthesia. All hearts under anesthesia are functionally deranged; that is, a normal heart under anesthesia is as vulnerable to derangement from vagal stimulation as an organically diseased heart would be without anesthesia. The potentially injurious effects on cardiac activity of vagovagal reflexes are preventable or at least can be minimized by atropine therapy. The climacteric gives rise to innumerable complaints. Hot flushes and palpitation are almost regular occurrences. A high percentage of women have palpitation, cardiac pain and dyspnea; a triad often found in organic heart lesions. These symptoms, Scherf has shown, were reversible with estrogen therapy. Electrocardiograms of such patients have revealed sinus tachycardias, depressions of the ST segment and flattening of the T waves, all of which disappear under estrogen therapy. Therefore all patients during the climacteric who have symptoms suggesting myocardial disease, particularly if they have fibroids and are about to be operated on, should have the benefit of estrogen therapy to exclude the possibility of a deficiency as being the etiologic factor.

Annals of Internal Medicine, Lancaster, Pa.

14:1315-1498 (Feb.) 1941

*Neurologic Symptoms and Clinical Findings in Patients with Cervical Degenerative Arthritis. S. R. Mettier and C. S. Capp, San Francisco.—p. 1315.
Studies in Cellular Exudates of Bowel Discharges: III. Diagnostic Significance of Cellular Exudate Studies in Chronic Bowel Disorders. Z. Bercovitz, New York.—p. 1323.
Role of Coronary Artery Disease in Etiology of Auricular Fibrillation. I. C. Brill and W. A. Meissner, Portland, Ore.—p. 1341.
Balance Between Capsular Polysaccharide and Antibody in Relation to Prognosis and Therapy of Pneumococcic Pneumonia. J. G. M. Bullowa, S. C. Bukantz and P. F. de Gara, New York.—p. 1348.
Observations on Absorption, Excretion and Distribution of Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole. E. Strauss, F. C. Lowell, F. H. L. Taylor and M. Finland, Boston.—p. 1360.
Problem of Rheumatism and Arthritis: Review of American and English Literature for 1939 (Seventh Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz.; J. A. Key, St. Louis, and C. McEwen, New York.—p. 1383.

Neurologic Symptoms in Cervical Arthritis.—Mettier and Capp analyzed the symptoms suggestive of cervical nerve-root origin in 30 patients presumably having osteoarthritis. Attempt was made to correlate the symptoms with the changes seen in the cervical vertebrae in roentgenograms taken in anteroposterior, lateral and oblique projections. The patients examined had symptoms characteristic of cervical radiculitis. Most of them were between 40 and 60 years of age. Only 3 were less than 40 years of age. The symptoms complained of were pain, rigidity of the neck and muscular weakness of the hand or arm. The onset of pain was usually abrupt and was localized in and about the shoulder, especially about the insertion of the deltoid muscle, or radiated down the arm into the fingers. As a rule these symptoms appeared months or even years before there were any complaints of neck discomfort. Usually the pain was unilateral. Some patients complained only of numbness and tingling in the fingers or of a drawing or dead, aching sensation in the muscles of the arms. Restriction of use of one upper extremity was a common complaint. There was no atrophy of the muscles of the hands, arms or shoulder girdle. The arm reflexes were normal. The presence or absence of arthritis in the cervical vertebrae was determined by roentgen observations. Marked hypertrophic changes were observed in 18 patients. These consisted of circumferential osteophyte formation which projected into the intervertebral canals from the superior or inferior vertebral margins, causing slight to marked narrowing of the foramens, depending on the size of the hypertrophic spurs. The osteoarthroses were more frequently on the left side. In the areas of exostoses the intervertebral disks were thinned out, causing slight narrowing to almost complete obliteration of the intervertebral spaces. The sites of predilection were between the fifth and sixth and the sixth and seventh vertebrae. The symptoms of 7 other patients were similar, but the roentgen signs of osteoarthroses were minimal in degree. There was a minimal to slight degree of osteophyte formation on the adjacent surfaces of the vertebrae, usually the fifth and sixth. This was accompanied by narrowing of the intervertebral disks in only 3 patients. In most of the patients there was some sclerosis of the articular facets. In the remaining patients there was no apparent abnormality of the articular facets, evidence of proliferative new bone formation at the vertebral margins, noticeable narrowing of the intervertebral foramens or thinning of the intervertebral disks in the roentgenograms. From the roentgen study it is evident that the combination of narrowing of the intervertebral foramens by the ingrowth of the marginal osteophytes and the decrease in the vertical diameter of the foramens, as seen in the 18 patients, may impinge on the nerve trunk as it passes through the involved foramens or may affect the sympathetic fibers con-

trolling blood flow. Why this process picks out the sensory fibers and does not also involve the motor fibers may be the fact that the motor fibers are fewer in number and comprise a bundle only one third the size of the posterior sensory fibers. Therefore actual diminution in the size of the nerve trunk may be sufficient to give rise to the radicular syndrome. It is unlikely that a similar process can adequately explain the neurologic symptoms arising in the other patients, as there was no radiopaque material in the intervertebral foramens suggesting impingement on a nerve bundle. The syndrome is of relatively frequent occurrence and, as a rule, is inadequately treated. The 30 patients were encountered in less than three months. Many had resorted to forms of treatment not regularly recognized by the medical profession. Those whose treatment was basically manipulative had definite relief. In the authors' clinic treatment consisted of heat to the neck, massage, manual traction and manipulation. Most of the patients were relieved of pain.

Archives of Internal Medicine, Chicago

67:473-708 (March) 1941

*Effect of Liver Therapy on Pathways of Spinal Cord in Subacute Combined Degeneration. C. Davison, New York.—p. 473.
Chronic Nonleukemic Myelosis: Report of Case with Megakaryocytic Myeloid Splenomegaly, Leukoerythroblastic Anemia, Generalized Osteosclerosis and Myelofibrosis. G. Carpenter and C. M. Flory, Chicago.—p. 489.
Smallness or Absence of Initial Positive Deflections in Precordial Electrocardiogram and Cardiac Infarction: Study of Patients Who Came to Autopsy. F. B. Cutts, A. H. Clagett Jr. and F. T. Fulton, Providence, R. I.—p. 509.
*Epidemic Poliomyelitis, Recurrent Encephalomeningoradiculitis and Fibromyositis in Relation to Streptococci Obtained from Water Supply. K. C. Rosenow, Rochester, Minn.—p. 531.
Postural Hypotension: Disease of Sympathetic Nervous System. E. A. Stead Jr. and R. V. Ebert, Boston.—p. 546.
*Aluminum Phosphate in Therapy of Peptic Ulcer: Effect of Aluminum Hydroxide on Phosphate Absorption. G. B. Fauley, S. Freeman, A. C. Ivy, A. J. Atkinson and H. S. Wigodsky, Chicago.—p. 563.
Acute Sclerosing Vascular Disease with Renal Changes: Report of Case. R. Katzenstein and J. P. Murphy, New Haven, Conn.—p. 579.
Estimation of Ascorbic Acid (Vitamin C) Requirement of Ambulatory Patients. Grace A. Goldsmith, A. T. Ogaard and D. F. Gowe, New Orleans.—p. 590.
Vitamin C (Ascorbic Acid) Nutrition in Bronchial Asthma: Estimation of Daily Requirement of Ascorbic Acid. Grace A. Goldsmith, A. T. Ogaard and D. F. Gowe, New Orleans.—p. 597.
Jejunal (Anastomotic) Ulcer: Clinical and Pathologic Study with Report of Eight Cases Encountered in 13,000 Necropsies. M. M. Montgomery and J. D. Kirshbaum, Chicago.—p. 609.
Pathogenesis and Pathologic Changes in Peptic Ulcer, and Production of Pain. J. Rabinovitch, B. Pines and I. Teicher, Brooklyn.—p. 620.
Electrocardiogram in Later Life. M. Eliaser Jr. and B. O. Kondo, San Francisco.—p. 637.
Differentiation of Acute Coronary Insufficiency with Myocardial Infarction from Coronary Occlusion. A. M. Master, R. Gubner, S. Dack and H. L. Jaffe, New York.—p. 647.
Hyperparathyroidism with Adenoma Causing Renal Failure and Secondary Hyperparathyroidism: Report of Case. R. S. Downs, Farmington, Conn., and V. Scott, Durham, N. C.—p. 658.
Diastatic Activity of Human Blood. M. Somogyi, St. Louis.—p. 665.
Bright's Disease: Review of Recent Literature. W. S. McCann, Rochester, N. Y.—p. 680.

Liver Therapy in Subacute Cord Degeneration.—Davison reports a postmortem study of 10 patients with pernicious anemia and neurologic signs and symptoms referable to the spinal cord. All 10 patients received liver therapy. Special study was made of the myelin sheaths, the axis cylinders and the glia. These were compared with the material studied in 1931 from untreated or inadequately treated patients. The series included 3 men and 7 women, between 35 and 76 years of age. Duration of illness varied from nine months to eight years, average four years and four months. All but 1 patient had at one time or another a blood picture typical of pernicious anemia. The 1 patient had a normal blood picture even before liver therapy was instituted. Diagnosis of pernicious anemia was made on the presence of neurologic signs referable to the posterior columns and achlorhydria. All 10 patients had achlorhydria and signs and symptoms of spinal cord involvement. The subjective neurologic symptoms improved in all but 1 patient, in whom improvement could not be evaluated because he was observed for only twenty-four hours. Objective improvement in the neurologic signs was observed in only 3 patients; in 2 the Babinski sign disappeared after liver therapy, and in 1 of these and the remaining patient the mental symptoms cleared up shortly after liver therapy was instituted. In 5 patients the histopathologic process involved the posterolateral columns of the cord. There was moderate gliosis in the involved pathways. The gliosis was most pronounced in the posterior columns, a condition which was best noted in the longitudinal sections. In 2 other patients the pathologic process was limited to the posterior columns and slightly to the right pyramidal tract. In the 3 remaining patients the gliosis was considerable and was present only in the posterior columns. These patients showed moderate destruction of the myelin sheaths and only slight destruction of the axis cylinders. Liver therapy was most effective in these 3 instances and led to the limitation of the process to the posterior columns, appreciable gliosis, moderate destruction of the myelin sheaths and only slight swelling of axis cylinders. In only this type of condition can improvement in the objective neurologic signs be expected. Improvement results only when there is slight destruction of the axis cylinders. Adequate liver therapy prevents further disintegration. The gliosis could not in any way restore normal function. Disease of the myelin sheaths may affect the axis cylinders and cause them to swell through irritation. Adequate liver therapy will also remove the disintegrating products and thus prevent further irritation. The sooner adequate treatment is instituted after neurologic signs and symptoms appear, the greater the chances for the signs and symptoms to disappear. Early adequate liver therapy may not only arrest or offset the progress of subacute combined degeneration of the cord but may also prevent the condition from becoming a complication of pernicious anemia, as shown by Strauss and his associates in a series of 80 cases.

Water Supply and Epidemic Poliomyelitis.—Rosenow reports the results of methods used for the isolation of pathogenic streptococci from a water supply during an epidemic of poliomyelitis in 1934 and recurring attacks of encephalomeningoradiculitis and fibromyositis in a group of patients in 1937. Streptococci were isolated more often from samples of water representing the central supply of the epidemic area than from water of control supplies, and much more often from samples obtained from the very periphery where poliomyelitis occurred and where patients who had encephalomeningoradiculitis and fibromyositis were cared for. The streptococci isolated from the water supplies resembled closely the streptococci isolated directly from patients served by the respective supplies. Each group of strains had well marked specific virulence and localizing power for animals. The serums of patients agglutinated specifically the respective strains of streptococci. The epidemic as a whole, judged by the usual epidemiologic criteria, almost certainly was not caused by contamination of the central water supply. The unprecedented high incidence of poliomyelitis among physicians and nurses attending the patients and in certain families and other groups and the high incidence of recurrent encephalomeningoradiculitis and fibromyositis during and after the epidemic would seem to incriminate the drinking water. It is considered that, in acute poliomyelitis occurring during the epidemic, the streptococcus was an integral part of the infectious process now generally attributed to virus and the cause of the unusual manifestations and that in the encephalomeningoradiculitis with fibromyositis it was the etiologic agent unassociated with the virus. The resulting diseases, however, were certainly not mainly caused by the streptococci contained in the central water supply but may have been due to peripheral "autogenous" contamination by excreta of the persons themselves. It also must be considered that the water may have been contaminated from the air. The author has isolated streptococci with specific properties from the air of rooms occupied by persons with various diseases, including poliomyelitis, and from outdoor air during epidemics.

Aluminum Phosphate for Peptic Ulcer.—Fauley and his associates present data which demonstrate that aluminum hydroxide gel interferes with phosphate absorption. They studied the effect of aluminum hydroxide gel on the excretion of phosphorus in the urine and feces of normal dogs, in 4 normal adult men receiving a "light ulcer diet," and in a child with marble bone disease on a low phosphorus diet. The results showed that aluminum hydroxide interferes with the absorption of phosphates and under certain conditions can cause a negative phosphorus balance. A phosphorus deficiency is not to be expected until the soluble aluminum salts are in excess of one

half of the total phosphorus in the diet. When this obtains in rats, chicks, guinea pigs and rabbits, the inorganic phosphorus in the blood may be reduced. Conditions predisposing to a negative phosphorus balance on aluminum hydroxide gel therapy are not likely to be present for a prolonged period in ulcer patients. The ordinary ulcer diets contain adequate phosphorus. But the possibility must be considered. Anorexia, though not pathognomonic of phosphorus deficiency, is a conspicuous symptom. Alkalis, gastric mucin, various diets and aluminum hydroxide and phosphate gel have been given Mann-Williamson dogs. The most favorable results were obtained with aluminum phosphate gel. Gastric mucin was definitely better than alkalis and aluminum hydroxide gel but was inferior to aluminum phosphate gel. The administration of large doses of mineral salts which react with the acidic or alkaline juices, whether such salts are absorbed or not, interferes with the natural mineral metabolism of the body. This disadvantage appears to be reduced by relatively inert substances, such as aluminum phosphate, which buffers acid and has a mildly astringent effect. Aluminum phosphate gel administered with a special diet prevented the development of ulcer in all but 3 of 23 Mann-Williamson dogs. After aluminum phosphate gel was discontinued and an ulcer developed, its administration caused complete healing of the ulcer in 9 of 10 dogs. These results were so favorable that aluminum phosphate gel was administered to 32 patients with duodenal and 2 with gastric ulcer to ascertain whether it might be of value. An ulcer diet was prescribed during the active stage of the ulcer combined with 15 cc., or occasionally 30 cc., of aluminum phosphate gel every two hours. Later a dose of 50 cc. with meals and at bedtime, or 30 cc. six times a day with and between meals, was prescribed. The diagnosis in all cases was supported by roentgen examinations. Seven of eight ulcer craters filled in, the exception being in 1 patient with a diagnosis of "subacute perforation" of a duodenal ulcer. This patient was not relieved by any therapy and was subjected to operation. Of 3 other failures 1 occurred in a patient with duodenal ulcer who had had many recurrences. He responded to rest, mucin and aluminum phosphate gel. Another patient with duodenal ulcer had a hemorrhage after fourteen days of treatment with aluminum phosphate and an ambulatory regimen. He responded promptly to management with rest, restricted diet, mucin and aluminum phosphate. The fourth failure was in a patient with duodenal ulcer who complained of intermittent atypical distress during several months of therapy. The same distress occurred with any type of management, and as the roentgen signs improved during management hypochondria was suspected. The response of all the other patients to the therapy was good. These results, the authors warn, should not be interpreted as indicating that aluminum phosphate therapy is superior to other therapies. The results indicate only that aluminum phosphate gel has the promise of being as effective as any other similarly acting medicament. The experimental results do not necessarily imply that alumimum phosphate gel is superior to aluminum hydroxide gel except in the presence of a relative or an absolute deficiency of pancreatic juice and bile.

Delaware State Medical Journal, Wilmington

13:17-34 (Feb.) 1941

Present Status of Vaccination Against Disease. J. A. Kolmer, Philadelphia.—p. 17.
*Immediate Allergic Reactions to Schick Test. J. R. Beck, Dover.—p. 26.

Immediate Allergic Reactions to Schick Test.—Beck reports three immediate allergic reactions which occurred in children who had been previously given a Schick test and who also had had alum precipitated toxoid before the first Schick test. The Schick tests which caused these reactions gave negative readings in all 3 children. It seems that hypersensitive persons may become sensitized to one of the proteins in the Schick material or in the alum toxoid, and on subsequent Schick testing an allergic reaction may occur. Its incidence is relatively infrequent, as the three reactions occurred among 15,726 Schick tests, and at least 4,000 individuals of the group had had two or more tests. Epinephrine should be on hand in the event that it might be needed, particularly when a person is being retested or has had alum precipitated toxoid. A tourniquet tied tightly enough to prevent rapid dissemination of the injected material may be of greater importance than the injection of epinephrine hydrochloride, but this the author did not do in his 3 cases.

Indiana State Medical Assn. Journal, Indianapolis

34:111-174 (March) 1941

Cerebral Hemorrhage. P. L. Stier, Fort Wayne.—p. 111.
Helping the Injured with Physical Therapy. N. H. Polmer, New Orleans.—p. 114.
The Council on Physical Therapy: Brief Review of Its Scope and Accomplishments. H. A. Carter, Chicago.—p. 115.
Surgical Applications of Physical Medicine. E. N. Kime, Indianapolis.—p. 117.
Medical Aspects of Physical Therapy. E. L. Libbert, Lawrenceburg.—p. 121.
Report on 1940 Hospital Survey on Physical Therapy. N. H. Prentiss, Fort Wayne.—p. 125.
Delirium Associated with Cataract Extraction. D. A. Boyd Jr. and Mary A. Norris, Indianapolis.—p. 130.
Uses of Progestin in Obstetrics and Gynecology. F. W. Peyton, Lafayette.—p. 136.
Office Management of Pelvic Diseases. W. H. Howard, Hammond.—p. 138.
Newer Proved Therapeutic Agents. M. Casper and G. J. Petro, Louisville, Ky.—p. 141.
Anesthesia for Oral Surgery During Infancy. J. D. Spaid, Dayton, Ohio.—p. 143.

Journal of Clin. Endocrinology, Springfield, Ill.

1:91-194 (Feb.) 1941. **Partial Index**

Hypothyroidism in Childhood: Parts III and IV. L. Wilkins and W. Fleischmann, Baltimore.—p. 91.
Pituitary and Adrenocortical Insufficiency: Use of Sodium Chloride in Treatment of Hypopituitarism. D. J. Stephens, Rochester, N. Y.—p. 109.
Oral Therapy of Testicular Deficiency: Methyl Testosterone Administered Orally to Patients with Marked Testicular Deficiency. W. M. Kearns, Milwaukee.—p. 126.
Adiposogenital Dystrophy: Study of Untreated "Fröhlich's Syndrome" Without Brain Tumor. S. C. Werner, New York.—p. 134.
Androgen Therapy in Psychosis: Effect of Testosterone Propionate in Male Involutional Psychotics. D. H. Pardoll and L. Belinson, Elgin, Ill.—p. 138.
Mammary Dysplasia: Corpus Luteum Studies: III. Progesterone Therapy in Chronic Cystic Mastitis. C. F. Geschickter, Baltimore.—p. 147.
Androgen Therapy in the Human Female. S. H. Geist, New York.—p. 154.
Rationale for Androgen Therapy in Gynecology. U. J. Salmon, New York.—p. 162.
Rationale of Androgenic Therapy in Gynecology. E. C. Hamblen, Durham, N. C.—p. 180.

Journal of Clinical Investigation, New York

20:107-248 (March) 1941. **Partial Index**

Renal Blood Flow in Coarctation of Aorta. M. Friedman, A. Selzer and H. Rosenblum, with technical assistance of Patricia McLean and W. Picard, San Francisco.—p. 107.
Measurements of Blood Flow and Blood Pressure in Clubbed Fingers. M. Mendlowitz, New York.—p. 113.
Toxicity of Orally Administered Potassium Salts in Renal Insufficiency. A. W. Winkler, H. E. Hoff and P. K. Smith, New Haven, Conn.—p. 119.
*Effects of Patent Ductus Arteriosus on Circulation. E. C. Eppinger, C. S. Burwell and R. E. Gross, Boston.—p. 127.
Cardiac Output and Other Measurements of Circulation in Coarctation of Aorta. H. J. Stewart and R. L. Bailey Jr., New York.—p. 145.
Lysolecithin and Hemolytic Anemia: Significance of Lysolecithin Production in Differentiation of Circulating and Stagnant Blood. K. Singer, Boston.—p. 153.
Pathogenesis of Azotemia in Hemorrhage from Upper Gastrointestinal Tract. J. B. Johnson, Rochester, N. Y.—p. 161.
Renal Tubular Excretion of Creatinine in Normal Man. J. A. Shannon and H. A. Kanges, New York.—p. 169.
Observations on Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid. E. Strauss, F. C. Lowell and M. Finland, Boston.—p. 189.
Hydrogen Ion Concentration of Duodenal Contents Under Fasting Conditions in Normal Persons and in Patients with Duodenal Ulcer: Comparative Study. R. W. Kearney, M. W. Comfort and A. E. Osterberg, Rochester, Minn.—p. 221.
Study of Urinary Riboflavin Excretion in Man. A. E. Axelrod; T. D. Spies, Cincinnati, and C. A. Elvehjem, with technical assistance of Velma Axelrod.—p. 229.
Studies on Infectious Mononucleosis: II. Relationship of Organisms of Genus Listerella to the Disease, as Studied by Agglutination Reaction. C. A. Janeway and G. J. Dammin, Boston.—p. 233.

Patent Ductus Arteriosus and Circulation.—Eppinger and his co-workers report the results of quantitative studies of the circulation in 6 patients with patent ductus arteriosus, and in animals in which a condition similar to a patent ductus arteriosus was produced at operation. In each of the patients

patency of the ductus arteriosus was confirmed at operation. The patent ductus arteriosus was the only demonstrable anomaly. The patients were selected for operation on the basis of impressive signs or symptoms and their ducts (which measured from 7 to 9 mm. in diameter) were presumably larger than many that are recognized. When the ductus arteriosus is patent the blood flow is from the aorta to the pulmonary artery. There is no flow of blood from the pulmonary artery to the aorta. Therefore these patients do not have arterial unsaturation and are not cyanotic. The volume of blood flowing from the aorta to the pulmonary artery varied from 4 to 19 liters per minute, which is from 45 to 75 per cent of all the blood pumped into the aorta by the left ventricle. These flows occurred in patients with large ducts and under temporary conditions known to elevate cardiac output. The left ventricle expelled from two to four times the volume of blood expelled by the right ventricle. Adjustment of the circulation to the patent ductus may be made by an increase in the output of the left ventricle. If this does not compensate completely for the leak through the ductus the blood flow to the periphery may also be diminished. Comparable studies in dogs supply direct evidence of the beneficial effects of operative closure which improves the peripheral circulation and reduces the work of the heart.

Journal Industrial Hygiene & Toxicology, Baltimore

23:93-128 (March) 1941

Studies of Workers Exposed During Production of Lead Bearing Steel (Ledloy). A. G. Kammer, East Chicago, Ind.—p. 93.
Atmospheric Concentration of Lead Fume Associated with Forging, Welding and Oxygen Cutting of Lead Bearing Steel, Based on Experimental Studies. J. W. Halley, East Chicago, Ind.—p. 100.
Effect of Short Rest Pauses in Standing and Sitting Position on Efficiency of Muscular Work. E. Simonson and N. Enzer, Milwaukee.—p. 106.
Carbon Tetrachloride as Industrial Hazard: Report of Two Cases. E. M. Hammes Jr., Boston.—p. 112.
Severe Pneumoconiosis Caused by Inhalation of Fullers' Earth. W. D. McNally and I. S. Trostler, Chicago.—p. 118.

Journal-Lancet, Minneapolis

61:69-104 (March) 1941

Beta Irradiation in Ophthalmology. W. K. Stenstrom, E. P. Burch and F. M. Walsh, Minneapolis.—p. 69.
Arm Suspension After Breast Operation. A. N. Collins, Duluth, Minn.—p. 72.
The Health of College Students and National Defense. Ruth E. Boynton, Minneapolis.—p. 74.
Carpal Bone Fractures: Report of Case. P. T. Sorenson, Minot, N. D.—p. 76.
Indications for Operative Interference in Obstetrics. R. J. Moe, Duluth, Minn.—p. 79.
Problem of Essential Hypertension. C. N. Hensel, St. Paul.—p. 83.
Congenital Absence of Common Duct: Three Cases in One Family. N. K. Hopkins, Arlington, S. D.—p. 90.
Hearing Impairment in College Students. H. Newhart, Minneapolis.—p. 92.
Diethylstilbestrol: Review of Literature. C. H. McKenzie, Minneapolis.—p. 94.

Journal of Nervous and Mental Disease, New York

93:281-420 (March) 1941

Sign of Babinski. K. Goldstein, Boston.—p. 281.
Exhaustion Due to Mental Excitement. C. J. Milling, Columbia, S. C.—p. 297.
Lilliputian Hallucinations During Convalescence of Scarlet Fever. N. Savitsky and S. Tarachow, New York.—p. 310.
*Lead Encephalopathy in Children and Adults: Clinicopathologic Study. A. J. Akelaitis, Rochester, N. Y.—p. 313.
Alcoholic Neuropathy with Multiple Sclerosis. S. Androp, Catonsville, Md.—p. 333.
Bergeron's Chorea. H. G. Hadley, Washington, D. C.—p. 344.

Lead Encephalopathy in Children and Adults.—Akelaitis made a clinicopathologic study of lead encephalopathy in 3 children, 2 of whom died, and 2 adults, 1 of whom died. The postmortem study suggests that the structural changes in children and adults are a result of edema with exudation and hyperplastic changes in the leptomeninges and endothelial cells of the blood vessels. However, in children the process is apparently more severe and the meningeal hyperplasia may lead to hydrocephalus. The lesions may vary with the duration of the intoxication before death occurs. The clinical picture in children is analogous to that of conditions in which the intracranial pressure is increased. The prognosis is grave and residuums are frequent if the child survives. The clinical picture in adults is analogous to that of any severe cerebral intoxication.

Journal of Nutrition, Philadelphia

21:209-320 (March) 1941. **Partial Index**

Cereals and Rickets: XIII. Phytic Acid, Yeast Nucleic Acid, Soybean Phosphatides and Inorganic Salts as Sources of Phosphorus for Bone Calcification. C. H. Kreuger, R. Bunkfeldt, C. R. Thompson and H. Steenbock, Madison, Wis.—p. 213.
Life Time Experiments on Problem of Optimal Calcium Intake. F. O. Van Duyne, C. S. Lanford, E. W. Toepfer and H. C. Sherman, New York.—p. 221.
Effect of Various Amounts of Caffeine on Gaseous Exchange and Respiratory Quotient in Man. J. Haldi, G. Bachmann, C. Enser and W. Wynn, Emory University, Ga.—p. 307.

Journal of Pediatrics, St. Louis

18:289-428 (March) 1941

Clinical Appraisal of Growth in Children. J. D. Boyd, Iowa City.—p. 289.
Levels of Ascorbic Acid in Blood Plasma of Apparently Healthy Children. F. E. Holmes, G. E. Cullen and W. E. Nelson, Cincinnati.—p. 300.
*Vitamin E in Treatment of Muscle Disorders of Infancy and Childhood. S. Stone, Manchester, N. H.—p. 310.
Vitamin K and Prenatal and Postnatal Prevention of Hemorrhagic Disease in Newborn Infants. F. S. Bruchsaler, Dallas, Texas.—p. 317.
Vitamin P and Capillary Fragility. H. G. Rapaport, with assistance of Sylvia Klein, New York.—p. 321.
Capillary Resistance in Rheumatic Children. E. E. Brown and Valentina P. Wasson, New York.—p. 328.
Formol Gel Test During Rheumatic Fever of Childhood: Comparison with Sedimentation Rate and Weltmann Reaction. R. I. Klein, S. A. Levinson and C. K. Stulik, Chicago.—p. 337.
Fibrinolysin Test in Rheumatic Fever. P. L. Beisvert, New Haven, Conn.—p. 357.
Electrocardiogram in Rheumatic Fever: Study of Sydenham's Chorea. E. T. Heffer, Brooklyn.—p. 363.
Hippuric Acid Liver Function Test in Children. S. Londe and J. G. Probstein, St. Louis.—p. 371.
Neural Maturation of Infant as Exemplified in Righting Reflex or Rolling from Dorsal to Prone Position. Myrtle B. McGraw, New York.—p. 385.
II. Effect of Cooking on Digestibility of Cereals. J. R. Ross, Doris Mountpenny and S. H. Jackson, Toronto.—p. 395.
*Banana Diet in Treatment of Typhoid Fever in Children: Preliminary Report. W. F. Schoffman, Phoenix, Ariz.—p. 399.

Vitamin E for Muscle Disorders of Children.—Stone treated 2 children with pseudohypertrophic muscular dystrophy and 2 with congenital myatonia with vitamin E. After from three to six months of treatment there has been a striking formation of new muscle tissue, generalized increase in strength and sense of well being. This has become apparent only since the children were placed on vitamin E. Only 1 of the patients has made a complete recovery. Through the facilities of the crippled children's and orthopedic clinics the effect of vitamin E has been observed on a large group of children between 1 and 5 years of age who came to the clinic because of poor muscular development, inability to hold up their heads until they were 2 or 3 years old, and retardation in beginning to stand or walk alone. The possibility that the muscle disturbances were caused by vitamin E deficiency in a lesser degree than present in muscular dystrophies and myatonias prompted the addition of vitamin B complex and vitamin E to these children's diets. While the vitamin B complex tended to improve their appetite or produced increase in weight, the response in muscle strength was rather slow. When vitamin E in the form of wheat germ oil was added to the vitamin B complex the increase in muscle strength was more rapid. Usually within a month the mother reported that the child was able to stand better, hold up its head, turn over without assistance and attempt walking alone. An increase in mental alertness was observed in some of the children. Children with flaccid musculature responded much better than the spastic group. The dosage in the dystrophic and myatonic group was from 2 to 4 cc. of fresh wheat germ oil given daily together with the vitamin B complex. In infants and young children with generalized muscular hypotonia the initial dose was from 8 to 12 minims (0.5 to 0.7 cc.) of wheat germ oil, preferably with vitamin B complex. Deficiency in the mother during pregnancy, or her inability to transmit vitamin E to the offspring, is possibly a factor in the development of an impaired musculature of the newborn infant. Probably certain types of muscular dystrophy, some myatonias (Oppenheim) and certain cases of poor muscular development

in the young infant are due to the same deficiency. This hypothesis is supported by the fact that vitamin E was of definite therapeutic value in such cases. As most children's diets are likely to be deficient in vitamin E, it is suggested that in certain obscure nervous and muscular disturbances of childhood vitamin E deficiency should be investigated as one of the causes.

Banana Diet for Typhoid in Children.—Schoffman observed 3 children who were fed abundant amounts of banana while ill with typhoid. Two of the patients were treated at home, and the laboratory data are not complete. All 3 patients, however, were so severely ill that their improved general state following the institution of the fruit and fruit-milk diet was not expected so soon in typhoid patients. The temperature curve decreased strikingly in from two to five days, even though the stools did not show such prompt improvement. The period of acute symptoms was shortened. The stools were negative for typhoid in from three to four weeks after onset of symptoms. The author believes that the banana and milk diet warrants further investigation.

Kentucky Medical Journal, Bowling Green

39:87-118 (March) 1941

Why Our Profession Sought a Premarital Law. A. T. McCormack, Louisville.—p. 94.
The Operation of the Premarital Law in the Physician's Office. F. W. Cundill, Louisville.—p. 94.
The Laboratory in Relation to the Premarital Law. L. H. South, Louisville.—p. 96.
Clinical Aspects of the Premarital Law. W. U. Rutledge, Louisville.—p. 98.
Syphilis, Its Modern Management. R. E. Teague, Louisville.—p. 100.
Use of Gold in Treatment of Arthritis. A. C. McCarty, Louisville.—p. 107.
Psychiatry and Military Service. J. D. Campbell, Louisville.—p. 110.

Maine Medical Association Journal, Portland

32:51-78 (March) 1941

Diabetes: Some Considerations from the Point of View of the Internist. S. Gundersen, Hanover, N. H.—p. 51.
Cardiovascular Problem with Renal Involvement and Hypertension. J. Gottlieb and C. W. Steele, Lewiston.—p. 56.
Blood Dyscrasia Presenting Clinical and Pathologic Problems: Case. J. Gottlieb, Lewiston.—p. 63.

Michigan State Medical Society Journal, Muskegon

40:161-240 (March) 1941

Self-Inflicted Injuries in Civil Practice. D. Hart, Durham, N. C.—p. 179.
Septic Branchial Cyst, Eradication by Electrical Cauterization: Report of Case. C. A. Berge, Detroit.—p. 189.
Cancer of Cervix: Time Wasted. O. E. Todd, Toledo, Ohio.—p. 191.
Moniliasis: Sulfapyridine Treatment. R. S. Van Bree, Grand Rapids.—p. 197.
Sulfamethylthiazole in Staphylococcus Albus Bacteremia Secondary to Carbuncle of Nose. D. L. Finch, Augusta, in collaboration with S. Alpiner and A. A. Humphrey, Battle Creek.—p. 199.
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Development of the Plasma Bank. O. A. Brines and J. E. Manning, Detroit.—p. 204.
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Missouri State Medical Assn. Journal, St. Louis

38:71-106 (March) 1941

Study of Epidemic Influenza, with Special Reference to 1940-1941 Outbreak in St. Louis. S. E. Sulkin, J. F. Bredeck and J. C. Willett, St. Louis.—p. 71.
Dwarfism. A. A. Werner, St. Louis.—p. 75.
Cervical Carcinoma Associated with Pregnancy at Full Term. W. T. Stacy and F. G. Thompson Jr., St. Joseph.—p. 82.
Repair of Arteriovenous Fistula and Resultant Aneurysmal Varix Between Femoral Artery and Vein. B. L. Neubeiser and B. H. Bradley, St. Charles.—p. 84.
Medionecrosis Aortae Idiopathica Cystica with Spontaneous Rupture: Report of Three Cases with Necropsies. J. W. Fleming, Moberly, and F. C. Helwig, Kansas City.—p. 86.
Histaminase: Clinical Experiences in Nonallergic Diseases. R. O. Muether, G. A. Mitchell, K. R. Andrews and G. Jones, St. Louis.—p. 89.

Nebraska State Medical Journal, Lincoln

26:77-118 (March) 1941

Toxemias of Pregnancy. C. P. Huber, Indianapolis.—p. 77.
Hemorrhage in Pregnancy. M. E. Davis, Chicago.—p. 84.
Treatment of Puerperal Sepsis. W. E. Brown, Omaha.—p. 91.

New England Journal of Medicine, Boston

224:401-440 (March 6) 1941

Management of Complications of Peptic Ulcer. T. G. Miller, Philadelphia.—p. 401.
Pelvic Delivery Under Local Infiltration Anesthesia. C. P. Sheldon, Boston.—p. 404.
Carcinoma of Esophagus Developing in Benign Stricture. E. B. Benedict, Boston.—p. 408.
Intravenous Drip Administration of Autonomic Drugs. A. Myerson and J. Loman, Boston.—p. 412.
Carcinoma of Cervix: Review of 200 Cases Treated with Radium. G. C. Wilkins, Manchester, N. H.—p. 414.
Encephalopathy Associated with Sulfamethylthiazole Therapy. E. Roseman and C. D. Aring, Cincinnati.—p. 416.
The Vitamins. A. P. Meiklejohn, Boston.—p. 420.

New York State Journal of Medicine, New York

41:531-642 (March 15) 1941

Virus Diseases in Childhood. F. H. Wright, Chicago.—p. 559.
The Male Factor in Fertile and Barren Marriage. R. S. Hotchkiss, New York.—p. 564.
Regional Enteritis: Report of Two Cases. I. E. Siris, New York.—p. 571.
Hemorrhage in Otolaryngology: Methods of Control. M. F. Jones, New York.—p. 580.
Tellurite Test for Diagnosis of Diphtheria. M. S. Stern, San Fernando, Calif., and M. B. Brahdy, Mount Vernon.—p. 588.
Prescription for Skin. H. Goodman, New York.—p. 590.
Program for Detecting Possible Toxic Responses to Varied Organic Chemical Exposure. J. H. Sterner, Rochester.—p. 594.
Office Treatment of Industrial Accidents. H. L. Prince, Rochester.—p. 600.
Convalescent Care at the Saratoga Spa. E. J. Callahan, Saratoga Springs.—p. 604.
Management of Clinical Problems Involving Larynx in Infancy and Childhood. C. A. Heatly, Rochester.—p. 607.

Northwest Medicine, Seattle

40:75-108 (March) 1941

Typhoid Typing an Aid to the Health Officer. W. Levin, Portland, Ore.—p. 77.
Status of Partial Gastrectomy in Duodenal Ulcer. V. C. Hunt, Los Angeles.—p. 81.
*Hereditary Hemorrhagic Telangiectasia. H. Alban, Kimberly, Idaho.—p. 86.
Isolated Myocarditis: Report of Case. I. R. Fox and R. M. Overstreet, Eugene, Ore.—p. 89.
Twenty-One Day Fever Curve. C. H. Sprague, Boise, Idaho.—p. 91.
Palliative Treatment of Acute Undiagnosed Skin Diseases. S. E. Light, Tacoma, Wash.—p. 92.
Factors to Be Considered in Management of Eczema. C. Dietrich, Tacoma, Wash.—p. 94.
Diphtheritic Membrane. S. S. Bozarth and L. J. Wolf, Portland, Ore.—p. 96.

Hereditary Hemorrhagic Telangiectasia.—During the last several years Alban encountered several members of a family exhibiting all the characteristics of hereditary hemorrhagic telangiectasia. Investigation indicates that this particular group is larger numerically than any family with this affliction heretofore reported in the American literature. At the rate that procreation is proceeding in this family, every one practicing in the Northwest will have a better than average chance of being called on for diagnosis and treatment of this disease. For that reason the author gives a general review of the established facts of the disease. In the family there have been no recorded deaths from hemorrhage, but its members say that they know it is not good for them to be operated on. The family tree chart indicates that there may be reason for this fear, as 4 members of the third generation have died postoperatively and 1 following childbirth. No explanation for these deaths has been elicited, and therefore the significance of an increased surgical hazard in this family is problematic. Investigation of six generations of this family revealed that 19 members were definitely affected and more will probably become affected as they reach the age at which telangiectasia usually develops. There is the usual preponderance of affected women and the usual transmission by either sex. Treatment consists principally of an attempt to arrest the bleeding and to maintain blood elements as close to normal levels as possible. The use of drugs and serums, long advocated, is without any rationale, since it has been definitely established that the condition is due to a hereditary maldevelopment of the vascular apparatus. When the general condition becomes poor and anemia is well defined, blood transfusion is used but is only of temporary value. Angiomas may be removed by chemical and electrical cauterization and by radium. The latter appears more promising and may prove to be the treatment of choice.

V 19

Public Health Reports, Washington, D. C.

56:311-364 (Feb. 21) 1941

Qualifications of Professional Public Health Personnel: IV. Sanitation Personnel. M. Derryberry and G. Caswell.—p. 311.
Studies on Active and Passive Immunity in Q Fever Infected and Immunized Guinea Pigs. Ida A. Bengtson.—p. 327.
Effect of Sodium Selenite on Blood Sugar and Liver Glycogen of Rats and Rabbits. C. I. Wright.—p. 345.

56:365-420 (Feb. 28) 1941

*Domestic Water and Dental Caries: I. Dental Caries Study, Including Lactobacillus Acidophilus Estimations, of a Population Severely Affected by Mottled Enamel and Which for the Past Twelve Years Has Used a Fluoride-Free Water. H. T. Dean, P. Jay, F. A. Arnold Jr. and E. Elvove.—p. 365.
Further Study of Rorschach Test Applied to Delinquents. M. J. Pescor.—p. 381.
Ornithodoros Viguerasi, New Species of Tick from Bats in Cuba (Acarina: Ixodoidea). R. A. Cooley and G. M. Kohls.—p. 396.

Domestic Water, Mottled Enamel and Dental Caries.—According to Dean and his associates, epidemiologic evidence points to an inverse relationship between endemic dental fluorosis (mottled enamel) and dental caries. Many of the epidemiologic, biochemical, bacteriologic and experimental aspects of this phenomenon have been discussed, but its mechanism is not clear. Whether this inhibitory agent operates locally or systemically or involves structural or compositional factors is undetermined. For the purpose of possibly clarifying several of the undetermined questions, quantitative epidemiologic studies were made of (1) populations exposed to waters of a relatively high fluoride concentration during the period of tooth calcification followed during the posteruptive period by waters free of fluorides and (2) populations whose teeth calcified while using waters free of fluorides but followed during the posteruptive tooth period by exposure to waters whose fluoride content exceeded the minimal threshold of endemic dental fluorosis 1 part per million. The study was made at Bauxite, Ark., a community which has occupied a prominent place in the history of mottled enamel since 1928, when the source of the water was changed. Although the number of school children available for study at Bauxite was limited, it consisted of all Bauxite pupils present on the day of sampling who had developed mottled enamel while using the "old" Bauxite water supply. They were mostly pupils in the high school and the higher elementary grades and ranged from 14 to 22 years of age. This group consisted of 26 who gave a history of continuous exposure to the Bauxite common water supply and 24 who had mottled enamel while using the "old" Bauxite water but whose water histories included minor breaks in continuity of exposure. All in this group showed a relatively moderate to severe type of mottled enamel. Another group consisted of 49 children from 8 to 13 years of age with a history of continuous use of the Bauxite common water supply, including 26 children from 8 to 10 years of age born more than one and one half years after the change in the water supply and 23 children from 11 to 13 years of age born within one and one half years of the water change. A roughly comparable group in age was had in 45 Benton (Ark.) high school pupils who had never used water containing an excess of fluoride. No mottled enamel was observed in any of these pupils. The dental caries experience rate for the permanent teeth of the 50 Bauxite pupils with mottled enamel was 314 per hundred children; the 45 Benton pupils with no mottled enamel showed a rate of 675. A previous study in 1939 by Dean and his collaborators has shown that the use of a domestic water with a fluoride concentration (1.8 parts per million) not greatly in excess of the minimal threshold for endemic dental fluorosis was associated with unusually low oral lactobacillus counts. Whether the observed effects were the result of local, systemic, structural or compositional factors in the teeth is not known. The incidence of dental caries in deciduous molars does not show the cumulative increase concomitant with increasing years of exposure. It actually reverses this trend; the highest incidence is observed in the youngest age group. With approximately nine years of exposure to the risk of dental caries, only six deciduous molars were carious, or 9 per cent of the sixty-six deciduous molars present in the 17 children born prior to the change in the water supply. In 21 children born within a year or two after the change and whose deciduous molars had approximately six and one half years of risk exposure thirty-one were carious or about 22 per cent of the one hundred and forty-one deciduous molars present. In 19 children born three and four years after the change fifty-two of these teeth showed carious involvement, or about 36 per cent of the 143 deciduous molars present.

Radiology, Syracuse, N. Y.

36:261-390 (March) 1941

Abnormalities of Small Intestine in Nutritional Disturbances: Some Observations on Their Physiologic Basis. R. Golden, New York.—p. 262.
Roentgen Diagnosis of Duodenal Ulcer. A. R. Bloom, Detroit.—p. 287.
Duodenal Diverticula. S. Weintraub and A. Tuggle, New York.—p. 297.
Anatomicoroentgenographic Study of Pleural Domes and Pulmonary Apexes, with Special Reference to Apical Subpleural Scars. H. W. Jamison, Los Angeles.—p. 302.
*Management of Cancer of Breast with Preoperative and Postoperative Irradiation. S. G. Schenck, Brooklyn.—p. 315.
Kidney Stones Simulating Biliary Concretions: Roentgenographic Study. G. Danelius, Chicago.—p. 324.
Evaluation of Cancer Statistics by Correlation Analysis. L. G. Jacobs, Winona, Minn.—p. 334.
Monomelic Medullary Osteosclerosis of Unknown Etiology. T. Horwitz, Philadelphia.—p. 343.
X-Ray Treatment of Leukemias. S. Rubenfeld and L. D. Scott, New York.—p. 352.
Calcified Mucocele of Appendix, with Rupture. H. W. Ostrum and R. F. Miller, Philadelphia.—p. 356.
Osteochondrodystrophy (Morquio): Case Reports and Follow-Up. R. J. Reeves and G. J. Baylin, Durham, N. C.—p. 362.

Preoperative and Postoperative Irradiation for Mammary Cancer.—As therapy depends on the stage in which the disease is first seen, Schenck considers the clinical types or "stages" of breast cancer. In stage 1 the tumor is usually small (less than 3 cm. in diameter), freely movable and confined strictly to the affected breast. No regional nodes are felt. In stage 2 firm nodes are palpable in the axilla, the primary tumor is usually larger than 3 cm. and partially fixed to the skin and the underlying tissues (pectoral muscle or fascia). The case belongs in stage 3 when the breast is edematous or its skin is inflamed, when the tumor is large, when it is more or less fixed to the skin and underlying structures, when adherent nodes are palpable in the axilla and in the supraclavicular fossa or when distant metastasis is present. Stage 4 is represented by recurrent cancer. When the diagnosis of breast cancer is warranted and the stage of the disease is determined, the patient should receive a thorough course of high voltage roentgen treatments. This series of treatments is all important and no compromise is tolerable. In stages 1 and 2 radical surgery is indicated from six to eight weeks after irradiation. This is to be followed from four to six weeks after operation by a second adequate course of roentgen treatments. Holfelder reports twice as many five year cures in patients receiving postoperative therapy as compared with those treated by operation alone. Roentgen sterilization of the ovaries, the author believes, tends to improve the end results and is at least advisable for all patients who are still menstruating. Patients with stage 3 cancers are mainly a roentgenologic problem. They should receive as thorough a course of roentgen treatments as their condition permits. The individual as well as the disease must be treated. This is followed by conservative surgery or radium therapy as the case indicates. Further roentgen therapy is given as it becomes necessary for relieving pain and discomfort. Recurrent cancer requires radium or roentgen therapy or both. Radiation therapy should be applied and managed only by expertly trained specialists. The entire affected breast is cross fired through two ports. The rays are directed tangentially through the anterior wall of the chest so that the underlying lung is avoided. Two hundred roentgens is given daily to each of the two ports for a total of from 2,000 to 2,600 roentgens to each area. The factors used are 200 kilovolts, 50 cm. distance and filters of 2 mm. of copper and 1 mm. of aluminum. At the completion of the treatments to the breast the axilla is cross fired through anterior and posterior ports. Two hundred roentgens is given daily to each of the two fields for a total of from 1,200 to 1,800 roentgens to each. Finally, the supraclavicular fossa is treated, through anterior and posterior ports,

each area receiving 200 roentgens daily for a total of from 1,600 to 2,000 roentgens. Little radiation sickness has followed this technic. The postoperative course of radiation therapy is similar to the preoperative treatments, except that dosage is kept within the lower limits. The anterior wall of the chest is treated by tangential, obliquely directed rays. The cutaneous reaction must be closely watched during therapy. The entire scar is included in the irradiation. If for any reason preoperative irradiation was omitted, postoperative therapy is given about two weeks after surgery or as early as is commensurate with the patient's condition. Roentgen therapy promotes rather than retards healing of the wound. The postoperative therapy is indicated to prevent local recurrence and regional metastasis. As a rule, only one postoperative course of treatments is given. Further therapy, either by the roentgen rays or by radium, is indicated only in the presence of recurrence or metastasis. Irradiation for local and regional recurrences should be cautiously and judiciously applied, bearing in mind that the skin has already been exposed to two episodes of epidermolysis. Nevertheless such treatments are not contraindicated.

Surgery, Gynecology and Obstetrics, Chicago

72:551-678 (March) 1941

Craniocerebral Injury. A. P. Rowlette and D. O. Weiner, St. Louis.—p. 551.

Pathogenesis and Treatment of Unilateral Exophthalmos. L. Davis and J. Martin, Chicago.—p. 557.

*Treatment of Diffuse Peritonitis by Direct Intraperitoneal Introduction of Sulfanilamide. S. Rosenburg and N. M. Wall, Pittsburgh.—p. 568.

Treatment of Acute Appendicitis in a Municipal Hospital. J. Burke and H. F. Kuhn, Buffalo.—p. 578.

Etiology and Pathology of Dupuytren's Contracture. H. W. Meyerding, J. R. Black and A. C. Broders, Rochester, Minn.—p. 582.

Teratoma Testis: Survey of Thirty-Seven Autopsy Records. B. S. Barringer and D. Earl, New York.—p. 591.

Arthrograms of Hip Joints of Children. E. Severin, Stockholm, Sweden.—p. 601.

*Implantation of Solid Pellets of Estrogens in Treatment of Menopausal Symptoms. G. H. Twombly and R. S. Millen, New York.—p. 605.

Carcinoma of Lower Intestinal Tract. R. E. Bieren, Baltimore.—p. 611.

Choice and Use of Cotton for Suture Material. S. A. Localio and J. W. Hinton, New York.—p. 615.

*Prevention of Human Bite Infections. R. E. Speirs, Dodge City, Kan. —p. 619.

Treatment of Rupture of Urethra, Especially When Accompanying Fractures of Pelvic Bones. J. H. Harrison, Boston.—p. 622.

Transumbilical Repair of Congenital Umbilical Hernia. J. B. Blodgett, Boston.—p. 632.

*Carcinoma Erysipelatodes: Subepidermal Lymphatic Metastases Confused with Operative Sequelae. M. R. Camiel and H. Bolker, Brooklyn.—p. 635.

Transurethral Prostatectomy: Photographic Record of Operation of Transurethral Resection. F. H. Colby and H. I. Suby, Boston.—p. 642.

Free Bone Flap Osteoplastic Craniotomy. E. Boldrey, San Francisco, and W. Cone, Montreal, Canada.—p. 646.

Management of Appendical Stump: Inversion Without Ligation of Stump. L. Felger, Los Angeles.—p. 650.

Superficial Infections Due to Anaerobic Streptococci: Indications for Zinc Peroxide Treatment. J. Reicher, Dayton, Ohio.—p. 651.

Varus Deformity of Ankle Following Injury to Distal Epiphysial Cartilage of Tibia in Growing Children. G. G. Gill and L. C. Abbott, San Francisco.—p. 659.

Fractures of Both Bones of Forearm in Children. B. M. Bosworth, New York.—p. 667.

Local Sulfanilamide for Diffuse Peritonitis.—Rosenburg and Wall describe the results in rats following intraperitoneal implantation of sulfanilamide powder for the treatment of diffuse peritonitis. Their clinical experience is limited to 10 cases: 7 of diffuse peritonitis secondary to perforated appendix and 3 miscellaneous cases of peritoneal contamination. Recovery occurred in all instances. In the animal experiments and clinical cases the general effectiveness of sulfanilamide was shown. However, the authors state that none of this proves anything with the exception that sulfanilamide introduced intraperitoneally is in no way locally destructive or harmful to delicate tissue such as the intestinal serosa. Intraperitoneal sulfanilamide appears to have some advantage over the parenteral method. The action is more than that of absorption and systemic action and probably is due to sulfanilamide action because of an increased focal concentration. In the human being the one instillation of intraperitoneal sulfanilamide should not be depended on. It should be immediately augmented by subcutaneous sulfanilamide. The introduction of powdered sulfanilamide into the peritoneal cavity at operation after the removal of the offending focus is not offered as a substitute for time honored and well established methods but merely as a positive additional weapon in the constant struggle against the disease.

Implantation of Estrogen Pellets for Menopausal Symptoms.—Twombly and Millen have implanted solid pellets of estrogenic materials in the treatment of 37 patients suffering from menopausal symptoms, 4 with kraurosis and leukoplakia of the vulva, 4 with leukoplakia buccalis or chronic stomatitis and 1, hyperfunction of the adrenal cortex. In general, those suffering from menopausal symptoms have been greatly relieved for from five months to more than a year. The patients with kraurosis have been improved but not cured. No effect has been noted on leukoplakia buccalis or chronic stomatitis. The only noticeable effect on the hirsute woman was the suppression of her scanty menstrual periods for two months. Pellets of 20 mg. of estradiol have proved most efficacious for prolonged alleviation of menopausal symptoms. The effective total dose has varied from one to three pellets implanted intramuscularly at intervals of one month. Their full effect becomes apparent in about one month. The effect lasts from five months to one year, as determined by improvement of subjective symptoms and vaginal smears. Pellet implantation is contraindicated in women with intact uteri as they have caused profuse and prolonged bleeding in 9 of 12 such patients. No bleeding has occurred in patients who have received castrating doses of radium some time before estrogenic therapy. Carcinomas of the breast or cervix have not been observed. Two carcinomas of the cervix and one dysgerminoma of the ovary have shown no accelerated growth after treatment.

Prevention of Human Bite Infections.—Speirs discusses the data in 114 cases of human bite infection seen within a few hours after the trauma. The method (gentle but thorough cleansing with soap and water, débridement only of damaged tissue and the application of a dry sterile dressing without suture) of Mason and Koch was followed in 82 cases and some variation of the procedure in the remaining 32 cases. There were no infected wounds among the 82 patients, except of 2 whose wounds over the knuckle were sutured. In 7 of the 14 patients who were treated with phenol and alcohol more evidence of inflammation developed than was usual; wounds became red, swollen and indurated but did not suppurate. Two patients with knuckle injuries which were cleansed and sutured required hospitalization later. The results in the entire group of cases have been gratifying, especially in comparison to former experience with cauterization, excision or extensive cleansing with strong chemical agents. The results confirm the author's belief that cleansing of the wound with soap and water within a few hours after the injury is the method of choice for prophylaxis of human bite infections. By this means the healing time of the wound is shortened and tissue destruction is minimized. In 35 patients the average time for complete healing was seven and eight-tenths days. In 60 other patients healing had progressed sufficiently far in an average time of four and nine-tenths days to warrant discharge. It is a good rule to consider any small penetrating wound on the hand as a human bite until proved otherwise. Bites on the fingers are generally on the distal phalanx. They vary from simple abrasions to compound fractures. Injuries to the lip range from penetrating wounds to almost complete avulsion, the latter being more common. Bites of the nose are usually extensive; they go through the ala severing the cartilage, the severed portion being attached only loosely over the bridge of the nose. After careful cleansing, loose approximation is permissible.

Carcinoma Erysipelatodes.—Camiel and Bolker present 2 typical cases of carcinoma erysipelatodes which developed following mastectomy. Both were mistaken for postoperative inflammatory complications, dermatitis venenata, fungous infection and radiodermatitis. The medicolegal importance of this is significant. The appearance of any peculiar cutaneous lesion following mastectomy for cancer should be regarded with suspicion and biopsy examination made. The pathologic material from repeated biopsies studied by serial sectioning indicated that the metastatic process was one of permeation of the subepidermal lymphatics and tissue spaces, rather than venous channels.

War Medicine, Chicago

1:143-300 (March) 1941

Nutrition Planning for the National Defense. R. M. Wilder, Rochester, Minn.—p. 143.
*The Soldier and His Heart. P. D. White, Boston.—p. 158.
Medical Aspects of Submarine Rescue and Salvage Efforts. A. R. Behnke, Washington, D. C.—p. 168.
Influence of Aircraft Performance on Selection and Care of Military Aviators. J. R. Poppen, Washington, D. C.—p. 180.
The Medical Reserve Officer of the United States Navy Afloat. E. R. Eaton, New York.—p. 188.
Nursing in a Program for National Defense. Pearl McIver, Washington, D. C.—p. 196.
Neuropsychiatric Aspects in the First World War and in the Present Emergency. I. J. Sands, Brooklyn.—p. 203.
The Army Medical Officer Looks at Psychiatry. S. A. Cohen, New York.—p. 205.
Psychiatric Examination in the Armed Forces. K. M. Bowman, New York.—p. 213.
Neuroses of War. A. Kardiner, New York.—p. 219.
Tetanus Toxoid for Prophylaxis. E. P. Jordan and G. Halperin, Chicago.—p. 227.
Diagnosis and Treatment of Venereal Diseases: Circular Letter No. 18. Prepared by the Subcommittee on Venereal Diseases of the Committee on Chemotherapeutic and Other Agents.—p. 247.

The Soldier and His Heart.—White reviews briefly the history of soldier's heart or neurocirculatory asthenia in the army. Various sources show that the chief problems concerning the soldier's circulation in the latter half of the last century were syphilitic aortitis and valvular heart disease (organic disease) and neurocirculatory asthenia (functional disorder). By 1914 to 1918 great advance had been made in weeding out important organic lesions at the time of enlistment. However some cases escaped detection and others developed in service, but "soldier's heart" became an outstanding problem. These conditions together ranked third in the causes for discharge from the British Army and Navy up to the last day of May 1918. The author states that his experience with the American Expeditionary Force in France in 1917 and 1918 was similar except that he, in comparison, found fewer organic lesions. After the World War there were (and there still are) a moderate number of so-called cardiac cripples. Most of these had neurocirculatory asthenia, which often was erroneously labeled "myocarditis" before neurocirculatory asthenia was recognized as a just cause for disability. A tabulation of 100 ex-soldiers sent to the United States Public Health Service Hospital showed 36 with a diagnosis of valvular heart disease or myocarditis. Further investigation revealed neurocirculatory asthenia alone in 45, aortic and mitral valvular disease in 16, mitral involvement alone (chiefly stenosis) in 7, aortic regurgitation alone in 6, other heart disease (1 of congenital and 1 of coronary disease) in 4 and 22 miscellaneous conditions other than heart disease. A considerable advance has been made in the last two decades in (1) rejection of new recruits with significant cardiovascular lesions, (2) early recognition of disabling cardiac conditions in the army itself and (3) measures to protect the soldier from some of the causes of heart disease, particularly syphilis and rheumatism. The 1938 report of the Surgeon General of the United States Army gave a death rate for 1937 of 3.48 per thousand among 175,624 officers and men, and only one tenth (0.35 per thousand) of the deaths were ascribed to diseases of the circulatory system as compared to the incidence cited by Myers for the British Army seventy-five years earlier, when the total death rate was more than twice as high and deaths from disease of the circulatory system three times as numerous. Now there is less heart disease in the army than in the civilian population, whereas from seventy-five to one hundred years ago soldiers actually showed a greater incidence. Of the grand total of 14.98 men per thousand discharged for disability from the United States Army in 1937, 0.92 per thousand had circulatory disabilities. Neurocirculatory asthenia no longer appears under diseases of the circulatory system but is included under diseases of the nervous system. The classification is probably still not correct. The discharge rate for neurocirculatory asthenia in 1937 was 0.24 per thousand; this is twice as great as the rate for coronary disease and a little greater than that for arteriosclerosis in other locations. In dealing with the problems concerning the soldier and his heart physicians must first try to hold the great gains that have been made in the last generation; this is difficult when large numbers of new recruits must be examined and enlisted. However some preparedness can be effected by careful universal periodic examination of the male population of military age in time of peace. This doubtless will some day be a routine public and private health measure. The important specific problems are: (1) to learn the range of the normal heart as to size, sounds, action, roentgen picture and electrocardiogram, (2) to decide what minor abnormalities may be safely passed for military service, (3) to detect beginning lesions of the heart and aorta, (4) to decide what newly acquired lesions or symptoms are compatible with military life and in what capacity and (5) to study coronary disease and severe neurocirculatory asthenia, in order to prevent or to minimize them or at least to recognize them early. A persistently high pulse rate is a more important indication of possible neurocirculatory asthenia of significance than an elevated blood pressure. The cardiovascular criteria for admission to the Army was revised last summer.

Wisconsin Medical Journal, Madison

40:169-268 (March) 1941

*Glucose-Insulin Treatment of Advanced Portal Cirrhosis. J. A. Schindler, Monroe.—p. 187.
Foreign Body in Appendix. A. R. Curreri and D. W. Melick, Madison.—p. 192.
Staphylococcemia and Agranulocytosis: Report of Three Cases, with Special Reference to Drug Toxicity. B. I. Pippin, Richland Center.—p. 194.
Inflammatory Cutaneous Metastatic Carcinoma. M. J. Reuter, Milwaukee, and R. Nomland, Iowa City.—p. 196.
Diagnosis of Early Neurosyphilis. W. Marshall, Appleton.—p. 201.
The General Practitioner's Role in Prevention of Eclampsia. J. M. Freeman, Wausau.—p. 204.

Dextrose-Insulin for Advanced Portal Cirrhosis.—Schindler points out that he has found dextrose-insulin treatment to "turn the trick" in cases of advanced portal cirrhosis refractory to medical measures. He states that three years ago while he was giving from 400 to 600 Gm. of carbohydrate daily to a patient with Laënnec's cirrhosis considerable amounts of dextrose were present in the urine. Thinking to obviate this gross waste of carbohydrate, he gave insulin in amounts sufficient to render the urine practically sugar free. If dextrose was given intravenously it was preceded by half an hour with an amount of insulin adequate to keep sugar from appearing in the succeeding urine. The ascites disappeared two weeks after insulin was begun and this in a patient who had twenty-eight paracenteses in thirty weeks. The patient remained otherwise on the original treatment. After two months insulin was withdrawn and in a fortnight paracentesis again became necessary. The insulin was resumed and again withdrawn on three subsequent occasions so that the relation of the insulin to the disappearance of the ascites seemed established. The same procedure was repeated in 2 additional patients with far advanced Laënnec's cirrhosis with similar results. After they had received insulin for nine, six and six months, respectively, the liver recovered sufficiently to function without the insulin. All the patients have returned to a fair degree of activity and their hepatic functions, as measured by the hippuric acid synthesis and other tests, are normal. The effect of the insulin when first used was neither foreseen nor expected. Most of available data indicate that, rather than causing a deposition of glycogen in the liver, insulin actually produces a glycogen withdrawal. However, recent work by Crandall tends to show that, when a hyperglycemia exists, insulin facilitates the deposition of glycogen in the liver; this establishes a rational basis for the use of insulin in these cases. With the disappearance of ascites, blood protein rises, and although it raises the osmotic pressure it cannot be a factor in the removal of the ascites because the increase is not appreciable until after the ascites has disappeared. This same treatment (high carbohydrate intake, yeast, thiamine hydrochloride and sufficient insulin to prevent glycosuria) has been tried in other forms of hepatic damage. It has not been successful in 2 cases of cirrhosis accompanying long standing cardiac decompensation and in 1 case of syphilitic cirrhosis. Although it appears to be strikingly successful in catarrhal jaundice, the nature of the disease renders therapeutic evaluation difficult and not trustworthy.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

63:295-384 (Dec.) 1940

Vasomotor Reflexes in Control of Body Temperature in Man. J. J. R. Duthie and R. M. I. Mackay.—p. 295.
Spinal Complications of Paget's Disease (Osteitis Deformans). J. W. A. Turner.—p. 321.
Suprapituitary Adamantinoma and Eunuchism. Gwenvron M. Griffiths.—p. 350.
Primary Degeneration of Granular Layer of Cerebellum: Unusual Form of Familial Cerebellar Atrophy Occurring in Early Life. R. M. Norman.—p. 365.

British Journal of Ophthalmology, London

25:97-140 (March) 1941

Changes in Fundus Oculi Following Splanchnectomy in Malignant Hypertension. F. T. Tooke and J. V. V. Nicholls.—p. 97.
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Simple Optical Appliance for Use with Respirators. P. Kinmont.—p. 122.

Journal of Endocrinology, London

2:141-262 (Dec.) 1940. Partial Index

Thyroid and Brain Respiration. R. J. Rossiter.—p. 165.
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Dose/Response Relation for Certain Principles of Pituitary Gland, and of Serum and Urine of Pregnancy. C. W. Emmens.—p. 194.
Calcium and Phosphorus Metabolism in Thyrotoxicosis. G. E. Beaumont, E. C. Dodds and J. D. Robertson.—p. 237.

Medical Journal of Australia, Sydney

1:193-222 (Feb. 15) 1941

Military Surgery. W. G. D. Upjohn.—p. 193.
Gas Tensions in Tissues in Pathologic Conditions. E. W. Sibree.—p. 201.

1:223-256 (Feb. 22) 1941

Method for Rapid Alkalization of Urine. Marjorie Bick and E. B. Drevermann.—p. 223.
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1:257-284 (March 1) 1941

*Bone Marrow Changes in Acute Infections and Effects of Sulfonamides on Marrow. T. E. Wilson.—p. 257.
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1:285-314 (March 8) 1941

Plan for Racial Health. S. Boyd.—p. 285.
Estimation of Isoagglutinin Titer of Human Serum and Its Practical Applications. Lucy M. Bryce and Rachel Jakobowicz.—p. 290.
Treatment of Fibrositis and Allied Disorders by Local Anesthesia. M. Kelly.—p. 294.
Use of Local Anesthesia in Relief of Chronic Pain. R. N. Howard.—p. 298.

1:315-344 (March 15) 1941

Freedom of the Medical Profession. A. E. Brown.—p. 315.
Isoagglutinin Titer of Pooled Serum or Plasma. Rachel Jakobowicz and Lucy M. Bryce.—p. 318.
Experimental Measles: Transmission of Disease to Monkeys, Failure to Transmit Measles to Rabbits, Cultivation of Virus on Chorio-Allantoic Membrane. E. W. Hurst and Barbara Cooke.—p. 323.

Bone Marrow in Infections and Effect of Sulfonamides on Marrow.—Wilson reviews the literature on the bone marrow changes following sulfonamide therapy and states that during the last four years more than 50 cases of neutropenia and agranulocytosis, 30 cases of hemolytic anemia and 1 case of leukoerythroblastic anemia have been reported. He has examined the marrow, either during treatment or immediately after death, of 20 patients treated with various amounts of sulfonamides, and in no instance was he able to find quantitative or qualitative changes in the marrow cells which were not present in the marrow of similar patients not treated with sulfonamides. In the reported cases sulfanilamide was practically the only sulfonamide associated with the development of acute hemolytic anemia, no case followed the use of sulfapyridine and in no case was its administration related to neutropenia. In the cases in which the marrow was examined it appears that associated with the neutropenia of the peripheral blood there was a partial or complete disappearance of the adult granular cells of the marrow and an increase in the more primitive granular series of cells. The author observed "toxic" granules in the cytoplasm of the neutrophil cells in the marrow smears. The degree depended on the severity of the infection. These granules were more numerous in the cells at the myelocyte stage than in the mature cells. In pernicious anemia changes were not found in the myeloblasts. Few macropolycytes were found in the bone marrow of patients with acute infections. Although they were present in the marrow of most of these patients, they were usually not released into the peripheral blood. It is suggested that the macropolycytes arise in infections because toxins interfere with the metabolism of the hemopoietic principle and from a direct toxic effect on the cells. There was no variation in the macropolycytes from the marrow of patients treated with sulfonamides and that from similar patients without such treatment. Nuclear budding and partial division of the nuclei of neutrophil cells and their precursors, only when prepared from curettings emulsified in serum, were most numerous in the marrow from patients with severe infections. Polykaryocytes or large multinucleated giant cells were found in the marrow of 3 patients with severe infections. It is suggested that these cells were osteoclasts. Sulfapyridine administered to 4 patients suffering from acute leukemia did not alter the clinical condition, the blood, the bone marrow or the prognosis. The conclusion is that when sulfonamides produce little or no effect on the peripheral blood there are no changes in the marrow which can be attributed to the therapy.

Practitioner, London

146:129-192 (March) 1941

Some Diseases of Retina. M. Whiting.—p. 129.
Sudden Failure of Vision. J. R. Wheeler.—p. 137.
Industrial Injuries of Eye. H. W. Archer-Hall.—p. 144.
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Use of Plaster of Paris for Air Raid and Other Casualties. A. S. B. Bankart.—p. 154.
Colles Fracture in General Practice. R. S. Garden.—p. 162.
Rheumatic Myalgias. M. G. Good.—p. 167.
Mountain Sickness. C. W. A. Searle.—p. 175.
Modern Therapeutics: XXI. Solanaceous Alkaloids and Relief of Spasm. R. St. A. Heathcote.—p. 178.

Quarterly Journal of Medicine, Oxford

10:1-64 (Jan.) 1941

Critical Review: Mechanism of Hemostasis. R. G. Macfarlane.—p. 1.
Clinical Value of Thiochrome Test for Aneurin (Vitamin B_1) in Urine. D. McAlpine and G. M. Hills.—p. 31.
Wernicke's Encephalopathy: Clinical Features and Their Probable Relationship to Vitamin B Deficiency. A. C. P. Campbell and W. R. Russell.—p. 41.

South African Medical Journal, Cape Town

15:41-60 (Feb. 8) 1941

Complications of Acute Appendicitis in 575 Cases. J. F. P. Erasmus.—p. 45.
Anesthesia in Thoracic Surgery. E. G. van Hoogstraten.—p. 49.

Tubercle, London

22:1-32 (Jan.) 1941

Treatment of Tuberculous Lung Cavities by Closed Suction Drainage—Monaldi's Method. H. Roche.—p. 1.

Bull. of Health Org., League of Nations, Geneva

9:1-130 (No. 1) 1940

Alcoholism in the Rural Environment. G. Szulc.—p. 1.
Ninth Analytic Review of Reports from Pasteur Institutes on Results of Antirabies Treatment. A. G. McKendrick.—p. 31.
Antirabic Immunization: Living Vaccines and Killed Vaccines. G. Proca and S. Bobes.—p. 79.

9:131-246 (No. 2) 1940

Report on Terminology in Malaria. R. Christophers, L. W. Hackett, E. Sergent, W. Schüffner and M. Ciuca.—p. 131.

Practica Oto-Rhino-Laryngologica, Basel

3:193-320 (Nos. 3-4) 1940

Sepsis After Angina. A. Weder.—p. 193.
Studies on the Perception of Sounds. A. Stefanini.—p. 285.
Nontuberculous Multiple Perforations of Tympanic Membrane. M. Schmidt.—p. 292.
*Air Embolism in Otosurgery. L. Fleischmann.—p. 295.

Air Embolism in Otosurgery.—According to Fleischmann, gaping of a vascular tear and negative pressure in the vein lead to aspiration of air. The first of these two factors exists in otosurgery, because the sinus wall is fixed to a rigid bone wall and spontaneous collapse is therefore impossible in case of tear. The jugular vein is likewise situated so that gaping of a tear is facilitated. The same is true of the subclavian artery. For this reason the cervical region is a dangerous zone as regards embolism. The sitting or half sitting posture, movements involved in swallowing and deep inspiration facilitate the entrance of air. Air embolism develops in otologic surgery generally during the change of dressings because factors favorable to entrance of air (sitting position, uneasiness of the patient and deep breathing) are more prevalent at that time than during the operation. Therefore manipulations on the sinus and change of bandage, especially after opening of the sinus, should always be carried out with the patient in the recumbent position. Since the healthy sinus wall may become diseased after the operation, and since it may tear while the bandage is being changed, the exposure of the healthy sinus is not without danger and should not be done unnecessarily. The author describes 3 cases in which air embolism developed but had a favorable outcome. Mild cases of air embolism may escape recognition. The most constant and important symptom is the sucking-gurgling noise produced by aspiration of air. It ceases if pressure is exerted on the vascular opening. Air vesicles or foamy blood may appear in the wound. The so-called mill-wheel sound is produced by the mixture of air and blood in the right side of the heart. Depending on its severity, it may be perceptible only by means of the stethoscope or at a distance of several meters. Other signs are dyspnea, cyanosis, coughing, palpitation, restlessness, a feeling of congestion, irregular pulse, and piercing pains in the chest. If air aspiration is slight, there may be almost no symptoms or the symptoms subside rapidly. Rapid aspiration of large quantities of air leads to collapse and may cause death within a few minutes or hours. After air aspiration has taken place, further intake of air should be prevented by placing the head low, applying tamponade to the sinus wound and compressing the jugular vein. The cardiac and pulmonary function must be maintained by cardiac stimulants, by artificial respiration and perhaps by intracardial injection of epinephrine.

Giornale di Clinica Medica, Parma

21:1451-1524 (Dec. 10) 1940. **Partial Index**

*Psychoses from Bromide: Cases. G. Nizzi Nuti.—p. 1451.
Granulocytopenic Acute Myclosis (Schultz's Type) with Hemorrhages: Case. S. Raffaele.—p. 1483.

Psychoses from Bromides.—According to Nizzi Nuti, psychoses from bromides are more frequent than generally believed. They show the acute phase of bromide intoxication. A neuropathic constitution, a diet poor in salt and a personal sensitivity to the drug are the most important predisposing factors. The diagnosis is made from the clinical history of the patient and the local and general clinical symptoms. The course and prognosis of the intoxication are, as a rule, benign. They depend on the acuteness of the intoxication and the functional condition of the kidney. The best and most simple treatment consists in immediate discontinuation of the drug and of any sedatives and the oral administration of 5 Gm. of sodium chloride daily for about one month. A diet rich in salt completes the treatment. During the first few days there is hyperbromidemia and aggravation of psychosis, which improves as the treatment progresses. When there is a great amount of bromides in the blood, repeated aspiration of the gastric juice with a stomach tube at frequent intervals is advisable. Sodium chloride and food are administered by the tube. Spinal fluid drainage may be resorted to in acute cases to prevent intracranial hyperpressure. The maintenance of normal intestinal and renal functions is constantly controlled. The author reports 2 instances in neuropathic patients who had had a diet poor in salt and diminished chloridemia. The amount of bromides in the gastric juice was increased before treatment and diminished after it. The basal metabolism, which was increased before treatment, became normal after. The amount of chlorides in the blood slightly increased. Discontinuation of bromides and salt therapy resulted in rapid recovery of the patients.

Medicina del Lavoro, Milan

31:145-168 (July) 1940. **Partial Index**

*Lipids in First Aid Treatment of Aniline Poisoning. C. Bellesini.—p. 156.

Lipids in First Aid Treatment of Aniline Poisoning.—Bellesini found that intravenous injection of lecithin or cholesterol to animals with acute aniline poisoning prevented hemolysis and the nervous symptoms of acute aniline poisoning. He reports satisfactory results with lecithin as first aid treatment in several cases of aniline industrial poisoning. The treatment consists of detersion of the skin which has been in contact with aniline, and three intravenous injections of 10 cc. each of lecithin at intervals of one hour. Detersion of the skin is done with swabs of absorbent gauze moistened in sulfuric acid; pressure is used in rubbing the skin with these swabs, which are changed frequently. In acute cases it is advisable to withdraw 250 cc. of blood immediately before injecting the lecithin, which is followed by hypodermoclysis of 250 cc. of dextrose saline solution. Both the lecithin injections and phleboclysis are repeated at intervals of one hour up to a total number of three. General warm or hot baths are harmful. Aniline is not soluble in water. The bath favors peripheral vasodilatation, by which the process of assimilation of the substance by the body is stimulated.

Archivos Argentinos de Pediatría, Buenos Aires

15:1-78 (Jan.) 1941. **Partial Index**

*Desoxicorticosterone Acetate in Dystrophy of Infants. F. J. Menchaca and N. Albarracin.—p. 15.

Desoxicorticosterone Acetate in Dystrophy of Infants.—Menchaca and Albarracin administered desoxicorticosterone acetate in conjunction with proper hygienic and dietetic therapy in 7 cases of dystrophy in infants in the first six months of life. The drug was administered in daily injections of from 1 to 1.5 mg. until from fourteen to twenty-five injections had been given for each series. The treatment consisted of two series of injections with a fifteen day interval. Satisfactory results were obtained in all but 1 case in which dystrophy was complicated by a pulmonary infection. The drug seems to have an especially favorable effect on the appetite and general condition of the patient, causing gain in weight.

Deutsche medizinische Wochenschrift, Leipzig

66:1389-1412 (Dec. 13) 1940. **Partial Index**

Deficiency of Vitamin K in Children. P. Plum.—p. 1389.
*New Points of View on Fundamental Change in Customary Ulcer Diets. F. Dittmar.—p. 1395.
Prognosis of Sepsis. H. Schulten.—p. 1399.
*Significance of Examination of Cerebrospinal Fluid for Diagnosis of Multiple Sclerosis. W. Klimke.—p. 1402.

Diets for Gastric Ulcer.—Dittmar points out that allergy is an important etiologic factor in inflammatory diseases of the gastrointestinal tract. Allergic gastritis and enteritis and their sequels, the gastric and duodenal ulcers, are comparatively frequent. The author estimates that about 30 per cent of all ulcers are allergic. The realization that nutritive antigens are responsible for the development of an allergic gastritis or ulcer also makes possible a causal, dietetic treatment. The pathogenic antigens contained in the food must be completely eliminated. This makes rational therapy possible and signifies a decisive turning away from the empiric procedure of recent decades; that is, away from the polypragmatism of the customary gastritis therapy inclusive of the diets intended to protect the stomach but which, from the standpoint of vitamins and calories, are deficient diets. The pathogenic antigens are determined by the usual methods. Their elimination from

the diet is important in the allergic forms of gastritis and ulcer, but the problems of allergy must be kept in mind also in the nonallergic inflammations of the gastric mucosa, because the inflammation increases the permeability of the intestinal wall and thus results in an increased resorption of inadequately decomposed, macromolecular foreign proteins. This eventually leads to the development of allergy to new substances. The author cites as an example the milk allergy which frequently develops after gastric operations and warns against too one-sided protein diets. He discusses the significance of the constant milieu, the physiologic course of the secretion of the gastric juice, and emphasizes that for reasons of physiologic ferment secretion the diet of patients with gastric disturbances must be similar to a normal diet. He directs attention to hypoglycemic conditions that may develop in the course of the mainly protein milk diets and stresses the necessity of the frequent administration of carbohydrates. The following points must be considered in the dietetic therapy of the nonallergic gastroduodenitis or ulcer: 1. The gastrointestinal tract must not be flooded with chiefly protein food. 2. A too one-sided diet should be avoided. 3. The equilibrium within the reactive milieu of the chyme must be considered so that the normal acceleration and inhibition of the ferment secretion is insured and with it the normal course of the resorption of foods and vitamins. 4. Carbohydrates must be given frequently and in generous amounts. The author outlines a diet which takes these points into account.

Cerebrospinal Fluid in Multiple Sclerosis.—Klimke reports 211 cases of multiple sclerosis diagnosed in his clinic. In 42 the cerebrospinal fluid obtained from the occipital as well as from the lumbar puncture was entirely normal. The author emphasizes this because he had observed in a number of cases that the occipital fluid was still normal when the lumbar fluid had disclosed pathologic conditions. The fluid should be withdrawn as near as possible to the most massive focus; that is, lumbar puncture would be preferable in most of the early cases of multiple sclerosis. The cerebrospinal fluid showed pathologic changes in 169 (80.54 per cent) of the cases. The colloidal gold chloride test produced a left-sided curve in 137 and a right-sided curve in only 29 cases. Two other cerebrospinal fluids exhibited only a mild lymphocytosis, and one showed a slight increase in albumin. Closer analysis of the fluids showing a left-sided curve disclosed thirty-two curves without increase in protein or cells, thirty-two curves with slight increase in protein (globulins), twenty-two curves with a slightly elevated cell count and fifty-one with increase in proteins and cells. The author concludes that the colloidal gold chloride reaction, more particularly the left-sided curve, is characteristic for multiple sclerosis. More than half of the curves (59 per cent) were like those seen in dementia paralytica; that is, there was discoloration in the first two tubes from blue to white. This strong discoloration was seen in nearly all cerebrospinal fluids that also had increased protein and cell contents. However, the same deep curve was observed also in many fluids that had only an increase in the cell count or only an increased protein content and even in many fluids in which both were absent. Thus the depth of the curve cannot be dependent on an increase in protein or cells. This manifestation was designated by Thurco as cytoalbuminocolloidal dissociation. The author thinks that, in the presence of deep left-sided curves without or with only slight increase in cell count and protein, the laboratory observations suggest the existence of a multiple sclerosis, provided syphilis reactions are negative. This picture is seen in no other disorder, except that in successfully treated dementia paralytica there remains a deep left-sided curve; however, if the left-sided curve is not too pronounced and there is a slight increase in proteins and cells, tabes dorsalis must be thought of, if the syphilis reactions are negative. The essential sign of dementia paralytica, that is, intense left-sided curves with moderate or severe increase in the cell count and in protein, particularly the globulins, the author observed so rarely in multiple sclerosis that it can be disregarded. The thirty-two cerebrospinal fluids with a right-sided curve disclosed atypical pictures the form of which was approximately 00012210000, associated with slight increase in cells and albumin. In 77 cases of multiple sclerosis the author was able to repeat the fluid examination several times in the course of the treatment. Six of the fluids with right-sided curves changed into typical left-sided curves and five became normal, whereas the other right-sided curves remained unchanged. The fluids with left-sided curve lost the increased cell count and protein content, but the curve remained uninfluenced. The author concludes that the change from a right-sided to a left-sided curve, the disappearance of the increase in protein and cells and the persistence of the left-sided curve indicate clearly that the left-sided curve without increase in proteins and cells, that is, the cytoalbuminocolloidal dissociation, is the characteristic picture of the cerebrospinal fluid of multiple sclerosis and that conditions resembling multiple sclerosis and presenting a right-sided fluid curve probably are not true multiple sclerosis.

Fortschritte der Therapie, Leipzig

16:377-412 (Nov.) 1940. **Partial Index**

*Oral Treatment with Estrogenic Substance in Ovarian Insufficiency. H. Gysi.—p. 377.
Treatment of Sympathetic Dystonia from Neurologic Point of View. H. Kölcke.—p. 388.
Bismuth Therapy of Tonsillitis. N. Maiwald.—p. 403.

Oral Estrogens in Ovarian Insufficiency.—Gysi treated extragenital symptoms of ovarian insufficiency, those occurring during the menopause as well as those accompanying disturbances in the genital cycle in younger women, by the oral administration of an estrogenic preparation. He concludes that from the perlingually administered alcoholic estradiol solution the hormone is absorbed by the oral mucosa and thus enters the systemic circulation without undergoing inactivation in the portal and hepatic circulation. For this reason the drops of estradiol solution should be taken undiluted and without a drink being taken immediately after. The patient should not swallow the drops. The drops of estradiol solution employed by the author contained 15 mg. of estradiol in 20 cc. He used this form of medication for 60 women, 30 of whom had previously received the same substance by injection. In the course of the injection treatment he had observed that particularly in the patients who were troubled by lassitude, insomnia, headaches and attacks of dizziness these symptoms were temporarily intensified before the favorable influence of the treatment became manifest. With the drop medication this could be avoided, because it was possible to subdivide the daily dose. This was corroborated in the majority of cases. On the whole, the oral medication with drops of estradiol solution produced the same results as were obtained by injection. In 50 of the 60 cases the drops alone rapidly counteracted the symptoms of ovarian insufficiency; in the other 10 cases injections of estradiol had to be added. The average daily oral dose was three times 10 drops, in severe cases five times 10 drops. For sensitive patients it is advisable to begin with somewhat smaller doses (5 drops three times daily). Whereas with injections the preparation becomes effective in about three days, the drop medication shows results only after five to seven days. Depending on the type and severity of the disorder and on the nature of the treatment, the medication must be continued for a longer period. Even after the symptoms have been counteracted, it is advisable to continue the medication with a smaller dose (three times daily 5 drops).

Klinische Wochenschrift, Berlin

19:1025-1048 (Oct. 5) 1940

Biologic Significance of Hyperplasia of Bone Marrow in Aplastic Anemia and Related Aregenerative Conditions of Bone Marrow. R. Stoltmeister.—p. 1029.
*Efficacy of Subcutaneous Implantation of Tablets of Crystallized Desoxycorticosterone Acetate on Bilaterally Adrenalectomized Dogs. F. Billmann and F. D. Grathwohl.—p. 1030.
Some Dermatotoxic Terpene Bodies. H. Riedel.—p. 1034.
Meningitis Due to Anthrax Bacilli. H. Gross and H. Plate.—p. 1036.
Liver Changes in Pulmonary Tuberculosis. A. Drasinich and Elisabeth Nagy.—p. 1037.

Implantation of Desoxycorticosterone Acetate Tablets in Adrenalectomized Dogs.—Billmann and Grathwohl report the results of experiments on 2 bitches with subcutaneously implanted crystallized desoxycorticosterone acetate tablets, undertaken to test the results obtained by Thorn, Engel and Eisenberg. They found that the dogs could be maintained by the implanted crystals in metabolic balance and good physical con-

dition. On explantation, the first signs of adrenal insufficiency manifested themselves in increased urination and intensified excretion of sodium and chlorine, with a reduced potassium excretion. Loss of body weight was, however, not noted usually until the fifth or sixth day, or the general symptoms of adrenal impairment, loss of appetite, increasing debility and vomiting. No modifications in the mineral levels of the serum nor a residual nitrogen increase were observed until the general symptoms had become pronounced. Failure to explant the tablets completely, as was seen in section on 1 dog, delayed the appearance of adrenal insufficiency for three weeks. The reimplantation of the tablets in the second dog was accompanied with signs of a critical insufficiency which necessitated medication with the drug in an oil solution. Gain of body weight and recovery of total metabolic balance did not occur until several days later.

Münchener medizinische Wochenschrift, Munich

87:1345-1376 (Dec. 6) 1940. **Partial Index**

Injuries and Impairments of Auditory Organ by Explosion and Sound. A. Greifenstein.—p. 1345.
*Observations on Epidemic Meningitis During 1940 Epidemics in Hungary. F. von Nádosy.—p. 1350.
Ulcer Problem. F.-A. Busch.—p. 1354.
Question of Heredity of Duodenal and Ventricular Ulcer. M. Lindlau. —p. 1356.
Use of Mercury Solutions for Diagnostic Purposes. H. Lipp.—p. 1363.

Epidemic Meningitis.—According to von Nádosy, cerebrospinal meningitis assumed epidemic proportions in Hungary during 1939 and 1940. During the height of the epidemic, between February and June 1940, 57 female patients with epidemic cerebrospinal meningitis were treated at the author's hospital. The ages of these patients varied between 10 and 68 years. Fifty-two of the patients received chemotherapy, chiefly in the form of sulfapyridine either alone or in combination with serum. Among these 52 the death rate was 7.6 per cent, whereas the total death rate (among the 57) was 12.3 per cent. This mortality rate is favorable when it is considered that the hospitalized cases are usually the more serious and the mortality rate for all Hungary was 18.5 per cent. However, even a death rate of 18.5 per cent is comparatively low when it is considered that it used to fluctuate between 20 and 80 per cent. The author thinks that the reduction in the mortality is probably the result of the introduction of the chemotherapy. He doubts that "epidemic" meningitis is always caused by the meningococcus of Weichselbaum, because the number of cases of meningitis caused by other organisms was considerable during the year under consideration. It is possible that these organisms (pneumococci, streptococci, staphylococci, tubercle bacilli and influenza bacilli) are only secondary causal agents in addition to meningococci. On the other hand, it is possible that at times of epidemics as yet unknown factors produce a "predisposition" to meningitis. The author thinks that treatment with meningococcus serum was only a supporting measure, because he found that serum therapy alone had unfavorable results whereas exclusive chemotherapy produced favorable results. Sulfapyridine was given as a rule from three to four times daily in doses of 1 Gm. This medication was continued for four or five days, the total dose amounting to 15 Gm. Myodegeneration or valvular lesions indicate an unfavorable prognosis, because among the patients with these disorders there were the most fatalities. Three patients remained deaf, and in 1 case acute encephalitis caused sudden death. Of 5 patients with bloody spinal fluid 1 died from hemocephalus internus. Myocardial changes, generally demonstrable only in the electrocardiogram, were present in almost half of the cases, but they were mild and transitory.

Wiener klinische Wochenschrift, Vienna

53:955-976 (Nov. 22) 1940

Asthma and Suitability for Military Service. A. Zimmer.—p. 955.
*Permanent Results of Thoracoplastic Interventions in Pulmonary Tuberculosis. H. Gärber and H. Kunz.—p. 957.
Noteworthy Case of Increase in Thrombocytes. V. Lachnit.—p. 963.
Indication for Operation in Patients with Gallstones. R. Friedrich.—p. 969.

Results of Thoracoplasty.—Gärber and Kunz report the results of 450 thoracoplastic operations on 219 patients with pulmonary tuberculosis, which were performed at a Vienna hospital between 1933 and 1939. Eight of the 219 patients died immediately after the intervention; that is, the early mortality amounted to 3.6 per cent. The authors say that thirty-two apical plastic operations were performed on 199 patients, one hundred and fourteen upper partial plastic operations, three anterior elastic plastic operations, one lower partial plastic operation and forty-nine total plastic operations. Cure (with negative sputum) was obtained in 104 patients, that is, in 52.3 per cent. Seventy-one of these 104 patients are able to work again. Thirty-three patients showed great improvement, whereas 21 patients either remained uninfluenced or became worse. Postoperative bronchogenic dissemination was the cause of two thirds of thirty-three late fatalities. Altogether, postoperative disseminations occurred in 52 patients. Apical thoracoplasty is contraindicated if active rales are demonstrable in the infraclavicular region. The authors recommend that in case of total as well as of partial thoracoplasty the first intervention should not be made on the apex but rather on the lower part, because the danger of postoperative dissemination is greater if the operation is begun from above. Total thoracoplasty should be planned in the presence of extensive processes and of large cavities.

Kekkaku, Tokyo

18:997-1078 (Nov. 24) 1940. **Partial Index**

*Virulence Studies of Avian Tubercle Bacilli. S. Asakawa.—p. 1000.

Virulence of Avian Tubercle Bacilli.—Three pathologic types of reaction, each exhibiting different degrees of virulence in rabbits, have been demonstrated in avian tubercle bacilli. These are the (1) Yersin type, which is characterized by generalized bacillemia without tubercle formation, (2) Villemin type, typified by acute miliary processes, and (3) chronic type, affecting chiefly the bones, joints and testes. Using several strains of avian tubercle bacilli, Asakawa made virulence studies in rabbits, with the following results: When virulent organisms were injected intravenously in large amounts, the animals showed the Yersin type reaction, whereas smaller doses resulted in the Villemin type reaction. In the former type of reaction the experimental animals became jaundiced in about seven days after administration and underwent sudden decrease in body weight. The greatest numbers of injected organisms were found in the liver and spleen, in which were seen globular masses of tubercle bacilli arranged in a spokelike pattern. Hyperbilirubinemia, which may be regarded as fairly specific to the effect of avian tubercle bacilli, followed the intravenous administration of organisms. Intraperitoneal injection resulted in an indefinite pathologic picture, and jaundice occurred but irregularly. After subcutaneous injection the only noticeable changes were those of local necrosis at the site of administration, no systemic manifestations being encountered. Intracutaneous injection of the suspension resulted in localized erythema and ulceration, followed by complete healing of the scar in from one to two months. The avian tuberculin test was strongly positive in animals infected with the organism. The author concludes that the type of reaction following injection of avian tubercle bacilli depends on the route and dose employed, and the Yersin type reaction is primarily a condition due to tubercle bacillemia.

Mitt. a. d. med. Akad. zu Kioto, Kyoto

30:1057-1372 (Dec.) 1940. **Partial Index**

*Pathologic Rupture of Urinary Bladder. K. Funakoshi.—p. 1057.

Pathologic Rupture of Urinary Bladder.—Funakoshi reports two cases of spontaneous or pathologic rupture of the urinary bladder, a condition which is regarded as extremely rare. The first patient, a man aged 62, gave a history of urethral stricture which had been surgically treated three years previously. The difficulty in urination, with passage of occasional blood clots in the urine and pain over the suprapubic area, continued for three years, when sudden stoppage of the urinary flow caused the patient to exert intra-abdominal pressure, which resulted in the rupture of the bladder followed by the appearance of a few drops of fresh blood from the urethral orifice. This accident was associated with abdominal pain and nausea. With the diagnosis of intra-abdominal rupture of the urinary bladder an exploratory operation was performed and the rupture verified. The sections made from a small block of tissue removed from the bladder revealed metastatic carcinoma

infiltrating the walls of the organ. The second patient, a man aged 24, gave a history of colon bacillus cystitis which occurred at the age of 12 years. Two days previous to admission he had a sudden pain in the lower part of the abdomen, which failed to improve with application of an ice bag and rest in bed. At operation a considerable amount of turbid yellowish fluid was found in the abdominal cavity; a complicating generalized peritonitis was apparent. The postoperative course was unsatisfactory, death ensuing on the thirty-fourth day. At necropsy the rupture of the urinary bladder was clearly found to be due to the effect of typical tuberculosis of the bladder. The author emphasizes the fact that in both cases the fluid found in the abdominal cavity possessed no odor characteristic of normal urine but that, when it was heated, a strong odor of typical urine developed. Chemical analysis of the fluid found in the abdomen, particularly for urobilinogen, is also of definite diagnostic aid in cases of pathologic rupture of the bladder.

Tokyo Igakkwai Zassi, Tokyo

55:1-107 (Jan.) 1941. Partial Index

*Studies on Alimentary Hypoglycemia. N. Kuzuya.—p. 48.
*Influence of Operative Intervention on Blood Gases in Surgical Diseases. T. Morikawa.—p. 75.

Alimentary Hypoglycemia.—Kuzuya's interest in alimentary hypoglycemia was aroused by the relatively frequent occurrence of spontaneous hypoglycemia in both diabetic and nondiabetic subjects. Using 3 normal persons, 14 diabetic and 36 assorted patients, including cases of spontaneous hypoglycemia and gastroptosis, the author endeavored to study the frequency occurrence, time interval and absolute values of blood sugar in alimentary hypoglycemia and its relation to fasting hypoglycemia. The test consisted of the oral administration of 30 Gm. of dextrose to nondiabetic and 10 Gm. to diabetic patients, and the blood sugar determinations were made thereafter at thirty minute intervals for five hours. From the results obtained the author concluded that alimentary hypoglycemia occurred in practically all the subjects tested, both diabetic and nondiabetic, and the most consistent finding was a blood sugar value of 80 to 90 mg. per hundred cubic centimeters at the peak of hypoglycemia. In diabetic patients having high sugar values before administration of the test doses, the development of alimentary hypoglycemia was relatively slight. In all the subjects the difference between the average blood sugar values before and after the test doses was about 20 mg. per hundred cubic centimeters; but in the diabetic patients this value was often exceeded. There seems to be no parallel relation between the extent of alimentary hypoglycemia and the fasting blood sugar level; naturally the patients with low fasting sugar values showed a less pronounced degree of alimentary hypoglycemia than those with high fasting levels. In the nondiabetic patients alimentary hypoglycemia occurred within two to three hours after administration of the test doses, whereas in the diabetic the level began to be depressed in three to three and a half hours. In patients with gastroptosis with disturbance in carbohydrate metabolism and in subjects with spontaneous hypoglycemia the blood sugar values frequently fell below 80 mg. per hundred cubic centimeters; these patients also frequently manifested marked hyperglycemia. The most pronounced and constant alimentary hypoglycemia occurred in patients having a mild but chronic type of spontaneous hypoglycemia; in two such cases the author was able to diagnose mild diabetes.

Blood Gases in Surgical Diseases.—Morikawa studied the influence of operative intervention on blood gases, using Barcrof's technic, in 20 surgical cases. In chronic chest diseases with relatively severe limitation in respiratory surfaces no appreciable increase occurred in oxygen unsaturation of arterial blood, although occasionally oxygen unsaturation of venous blood may reach above 10 volumes per cent. In mild inflammatory conditions involving other areas of the body the arterial blood showed a slight increase in oxygen unsaturation, but the venous blood tends to decrease in oxygen capacity with a concomitant decrease in carbon dioxide content in patients with severe circulatory disturbance. In carcinoma of the stomach the oxygen combining power is decreased but the oxygen unsaturation of the venous blood is increased. The greatest decrease in oxygen capacity was seen in pneumoplasty; in laparotomy the value increased but slightly. The oxygen unsaturation of the arterial blood tended to increase in pneumoplastic operation; that of the venous blood showed a tendency to decrease, the extent of fluctuations depending on the nature of the operative procedures. The carbon dioxide content of blood decreased temporarily after an operation but increased after two to three days and remained high. Blood transfusions caused temporary elevation of oxygen capacity but later depressed it. The oxygen capacity of the blood showed a slight increase during anesthesia with morphine and scopolamine, but no effect was seen with injection of camphor or in lumbar anesthesia. The carbon dioxide content of blood usually decreased under anesthesia.

Nordisk Medicine, Stockholm

9:1-80 (Jan. 4) 1941. Partial Index

Norsk Magasin for Lægevidenskapen

*Chylothorax. A. Høyer.—p. 40.

Chylothorax.—Høyer says that chylothorax, an accumulation of intestinal lymph in the pleural cavity, is an exceedingly rare condition which was first described by Bartolet in 1633. Up to 1938 only 84 cases had been reported in the literature, 48 of them of traumatic origin. The mortality rate is about 50 per cent. The case reported is the first of its kind to be published in Norway. A man aged 56 was run into by an automobile and hit in the right side. There were fractures of the ninth, tenth and eleventh ribs on the right side, in two places in the tenth rib, fracture of the right elbow and of the right fibula. Five days after the accident severe symptoms of shock appeared, and roentgen examination showed a total exudate in the right pleural cavity. In the course of ten days 6,600 cc. of exudate was aspirated from the cavity. The exudate at first resembled cocoa and gradually became cream colored. Chemical analysis of the exudate revealed values typical of chyle. After the last tapping the chyle effusion ceased. Forty days after the accident the patient was discharged as well.

Ugeskrift for Læger, Copenhagen

103:63-100 (Jan. 16) 1941. Partial Index

*Enlargement of Liver in Diabetes Mellitus: Examinations by Means of Liver Biopsy. N. B. Krarup and P. Iversen.—p. 63.
*Steatosis of Liver Treated with Vitamin B_1: Examinations by Means of Liver Biopsy. P. Iversen and N. B. Krarup.—p. 66.
Histopathology of Liver in So-Called Arsphenamine Jaundice, Examined by Means of Aspiration Biopsy. K. Roholm and N. B. Krarup.—p. 68.
Histologic Examinations by Means of Liver Biopsy in Intermittent Juvenile Jaundice. N. B. Krarup and K. Roholm.—p. 72.

Examinations of Liver in Diabetes.—Krarup and Iversen report that in their two cases of grave juvenile diabetes with considerable enlargement of the liver the microscopic examinations made on liver biopsy showed the enlargement to be primarily due to an edematous choking of the individual liver cells; a slight fatty degeneration was also seen. The amount of glycogen did not exceed that found in normal livers. In one case there were considerable degenerative changes in the liver in the form of glycogen in the nuclei. In both cases the hepatic enlargement completely subsided after treatment consisting exclusively of regulation of the diabetes with diet and insulin, and simultaneously the microscopic changes disappeared, except those in the nuclei, which continued during the period of examination.

Treatment of Steatosis of Liver with Vitamin B_1.—Iversen and Krarup examined 100 medical patients by liver biopsy. The 38 found to have steatosis of the liver included 27 of the 31 chronic alcoholic addicts in the entire material; the remaining 11 had various grave disorders. On the basis of their experience with liver biopsy on the whole the authors regard fatty infiltration of the liver as pathologic. They say that marked steatosis of the liver is frequent in chronic alcoholic addicts. Only a small percentage of these show simultaneous cirrhotic changes in the liver. Steatosis of the liver is not a stable condition but may disappear in the course of weeks or months. Whether its disappearance is due to the treatment with vitamin B_1 or is a result of general hospital care together with abstinence is uncertain.

Book Notices

What Price Alcohol? A Practical Discussion of the Cause and Treatment of Alcoholism. By Robert S. Carroll, M.D., Medical Director, Highland Hospital, Asheville, North Carolina. With preface by Adolf Meyer, M.D., LL.D., Sc.D., Henry Phipps Professor and Director of the Department of Psychiatry, Johns Hopkins University, Baltimore. Cloth. Price, $3. Pp. 362. New York: Macmillan Company, 1941.

At a time when the seriousness of the problem of addiction to alcohol is beginning to be realized and approached scientifically, it is deplorable that pseudoscientific attitudes should be placed before the public. This book, although written by a physician and psychiatrist, seems to be a moralizing treatise on the evils of alcohol, smoking and overeating, with little scientific flavor. The author's thesis as to the etiology of alcoholism might be condensed into three main factors: (1) the high speed and tension of modern living, (2) inherited neuroticism or defective constitution and (3) overindulgent upbringing. There is much discussion of defective blood-brain barriers, inherited defective nervous system, hormone dysfunction and synapse dysfunction to explain the alcoholic addict's apparent sensitivity to alcohol. There is little psychologic understanding. The author objects strenuously to the use of alcohol even medicinally; he also objects to any drug-containing food or beverage in the life of the right living person and inveighs repeatedly against coffee, tea, cocoa, cigarets and soft drinks containing caffeine. He is convinced that chronic self intoxication and toxicity through overeating and eating too many sweets is at the bottom of much emotional maladjustment. His treatment program, as far as one can abstract it, comprises institutionalization, tapering off and then complete abstinence from alcohol and tobacco, occupational and recreational therapy, careful diet and health building, and psychotherapy. Return of the impulse to drink is countered with a dose of castor oil and a meatless meal, then perhaps a second dose if the impulse has not departed. The psychotherapy—which apparently is done by teachers or psychologists—involves much ethical discussion, reeducation and exhortation. The author refers vaguely to "analysis" but certainly does not mean psychoanalysis.

Brucellosis or Bang's Disease of Farm Animals. By C. P. Fitch and W. L. Boyd. University of Minnesota, Agricultural Experiment Station, Bulletin 348. Paper. Pp. 32, with 12 illustrations. St. Paul, 1940.

This bulletin was prepared primarily for distribution to veterinarians, dairymen and farmers, but it contains much information of interest and value to physicians. The widespread incidence of brucellosis in human beings has caused physicians to give heed to the manner in which brucellosis may be prevented and controlled in cattle. The excellent work of Dr. Fitch and his associates at the Agricultural Experiment Station of the University of Minnesota, St. Paul, in the control of brucellosis (Bang's disease) of cattle and swine is well known to students of brucellosis in human beings. It is to be deeply regretted that Dr. Fitch died in January 1940 while the manuscript of this publication was being prepared. Fitch and Boyd have found that approximately 12 per cent of the cattle tested in Minnesota are positive reactors to the agglutination test for brucellosis. They have found this test to be a safe, reliable and practical method of diagnosis of brucellosis in cattle. It has exhibited an efficiency in excess of 95 per cent. Too much reliance should not be placed on a single negative test, especially if there is evidence of active infection in the herd or if the blood sample is taken a few days before or after a calving or abortion. The federal-state plan for the elimination of brucellosis and the establishment of brucellosis free accredited herds is making good progress, and cattle owners are becoming more and more aware of the economic advantages of ridding their herds of Bang's disease. Reasonable indemnity payments are made by matched federal and state funds. Retesting of a herd should be done not more than thirty to sixty days after the first tests were made. Blood testing should be continued preferably at ninety day intervals until the herd has passed three entirely negative tests. A single negative test is not conclusive proof of the absence of brucellosis. The introduction of diseased females into healthy herds is the most common method of spreading the disease from one herd to another. Additions made to the herd should be from herds tested and known to be free from Bang's disease. Pregnant animals should be kept in quarantine for at least ninety days after calving before being introduced into the herd and then only after the blood test is known to be negative. Vaccination of calves with a living vaccine of reduced virulence for the control of this disease in cattle is still in the experimental stage. All milk and milk products used in the feeding of negative herds should be from brucellosis free cattle or should be pasteurized. Milk from positive reactors is a dangerous source of spread of the disease, both to other cattle and to human beings. Bulls in brucellosis free herds should be used for service only on cattle that have been tested and found free from Bang's disease. Progressive breeders and milk producers are now fully aware that their herds must be free from brucellosis in order to realize the maximum financial return. The control of Bang's disease by area testing at present is the most satisfactory method for the control of this infection.

Hygiene: A Textbook for College Students on Physical and Mental Health From Personal and Public Aspects. By Florence L. Meredith, B.Sc., M.D., Professor of Hygiene, Tufts College, Boston. Foreword by Frank Howard Lahey, M.D., D.Sc., LL.D., President-Elect, American Medical Association. Third edition. Cloth. Price, $3.50. Pp. 822, with 184 illustrations. Philadelphia: Blakiston Company, 1941.

The present edition of this well known textbook has been completely rewritten and, as with the previous editions, has been prepared especially for the college student. The theme which the author states she has tried to carry throughout the book is a discussion of the health situation which exists in the life of individuals and peoples, what health objectives arise from them and what action is scientifically appropriate on the part of the layman. This theme is introduced with an excellent general discussion of the health situation and trends in the United States, as evidenced by a study of the vital statistics of this country. About one half of the book is devoted to a consideration of the hygiene of the individual. This includes the usual discussion of circulation, digestion, respiration and reproduction. There is great detail on the anatomy and physiology of each of the systems of the body as well as the principles of hygiene relating to each system. For the college student much of this detail seems unnecessary and elementary. Because of such detail the book is more voluminous than the average college hygiene program can cover. The material on infection and resistance is well presented, and there is an excellent discussion of scientific medical practice compared to the practice of the cults. On the whole, the book is one of the most comprehensive treatments of the subject of hygiene that have been published. It would make an excellent reference book for the teacher of hygiene in the elementary and secondary school. For the use of college students it would have been more usable had there been omitted some of the detailed anatomy and physiology.

Diagnostic Procedures and Reagents: Technics for the Laboratory Diagnosis and Control of the Communicable Diseases. Cloth. Price, $2.75. Pp. 352, with illustrations. New York: American Public Health Association, 1941.

This new book on technics for the laboratory diagnosis and control of the communicable diseases is the result of a seven year survey of the best laboratory methods now available for the recognition and control of the communicable diseases. The work was begun in 1933 by a special committee of the American Public Health Association on the preparation of reagents and the description of methods used in the public health laboratory. Those persons best qualified to describe the various procedures were selected as referees. The book marks the beginning of a development which should have an important influence on medical and administrative practice in the field of communicable disease control.

There are fifty pages by Arthur Parker Hitchens on culture mediums, stains, reagents and solutions. This chapter includes a list of sixty-six references. There are nine pages by Edmund K. Kline on the toxicity of dyes for certain bacteria. The next chapter, of twenty-four pages, on the meningococcus is written by Sara E. Branham of the National Institute of Health. There are twenty-six pages on the gonococcus by Charles M. Carpenter.

Tularemia is presented by James G. McAlpine and George D. Brigham in fourteen pages. Brucellosis, in twenty pages, is described by Arthur Parker Hitchens and Frances Sullivan. Then come chapters on Haemophilus pertussis by Pearl Kendrick and George McL. Lawson (eighteen pages), the pneumococcus by Elliot S. Robinson (twenty pages), hemolytic streptococci by Julia M. Coffey (fifteen pages), bacterial food poisoning by Stewart A. Koser (seventeen pages), typhus fever and other Rickettsial infections by Henry Welch (ten pages), Eberthella typhosa and other bacillary incitants of enteric disease by Marion B. Coleman (twenty pages), the diphtheria bacillus by Martin Frobisher (thirty pages), the tubercle bacillus by A. L. MacNabb (twelve pages), examination of specimens for Spirochaeta pallida by Ruth Gilbert (three pages), serodiagnosis of syphilis by Ruth Gilbert and Elizabeth Maltaner (twenty pages), examination of cerebrospinal fluid for evidence of syphilis of the central nervous system by Ruth Gilbert (three pages), rabies by T. F. Sellers (fourteen pages), and pathogenic fungi by W. D. Stovall and Lois Alman (seventeen pages). There is a sixteen page index.

This new book is the best and most authoritative publication on the laboratory diagnosis of the communicable diseases. It is safe to predict that it will soon be found in the hands of all laboratory workers interested in the diagnosis and prevention of the communicable diseases.

Progress of Scientific Research in the Field of the Exceptional Child. Proceedings of the Sixth Institute on the Exceptional Child of the Child Research Clinic of the Woods Schools, a Private School for Exceptional Children at Langhorne, Pa., Tuesday, Oct. 24, 1939. Paper. Pp. 64, with illustrations. Langhorne, [n. d.].

This pamphlet is a report of the proceedings of the Sixth Institute on the Exceptional Child, conducted by the Child Research Clinic of the Woods Schools, a private school for exceptional children at Langhorne, Pa. Although the institute was held in October 1939, the pamphlet was not received for review until Jan. 17, 1941.

The program consisted of a morning and afternoon session, during which five papers were presented with the following titles and authors:

The Child, The Savage, and Human Experience
A. Irving Hollowell, Ph.D.
University of Pennsylvania.

What Is An Exceptional Child?
W. E. Blatz, Ph.D.
University of Toronto.

The Interplay Between Intellectual and Emotional Factors in Personality Diagnosis.
Bruno Klopfer, Ph.D.
Rorschach Institute, New York.

A Method for the Study of Personality Reactions in Preschool Age Children by Means of Analysis of Their Play.
J. Louise Despert, M.D.
Payne Whitney Psychiatric Clinic
New York Hospital, New York.

A Special School Looks at Special Education.
Charles M. Morris, Ph.D.
Woods Schools, Langhorne, Pa.

The papers are presented apparently in full, with extensive bibliographic notations. A specimen chart of the Rorschach method, which is a projective method for the study of personality, is attached.

This publication should be useful and interesting to physicians and psychologists interested in the exceptional child.

The Comparative Physiology of Respiratory Mechanisms. By August Krogh. Publication of the William J. Cooper Foundation. Cloth. Price, $3. Pp. 172, with 84 illustrations. Philadelphia: University of Pennsylvania Press; London: Oxford University Press, 1941.

This volume is an outgrowth of a series of lectures delivered at Swarthmore College in 1939 and represents an important contribution to the physiology of respiration. Professor Krogh has put together in his inimitably simple and interesting way a review of his own and others' work on respiratory mechanisms in numerous forms of animal life. Although the book is full of detailed information, as would be evident from the illustrations and tables, the description of how respiratory mechanisms of diverse types meet the peculiar needs of animals in various environmental situations is easy and fascinating reading. In describing respiratory mechanisms involving (1) simple diffusion in small aquatic forms, (2) water lungs, (3) branchial water gills, (4) air breathing gills, (5) diffusion lungs and (6) ventilation lungs, the author has covered the comparative physiology of external respiration. Many ingenious devices for studying such respiratory mechanisms are described. A comprehensive section covers the mechanisms in aquatic mammals, in which great pressure differences come into play. Another valuable section of the book considers the gas transporting mechanisms of the blood in hemoglobin and hemocyanin containing forms, including the adaptations to high altitude, to low oxygen tension and to high pressures. The book brings together a wealth of material from obscure sources of great value in understanding better the respiratory mechanism in man.

A Review of the Psychoneuroses at Stockbridge. By Gaylord P. Coon, M.S., M.D., Chief Medical Officer, Boston Psychopathic Hospital, Boston, and Alice F. Raymond, A.B., Statistician, Department of Child Hygiene, Harvard School of Public Health, Boston. Cloth. Pp. 299. Stockbridge, Massachusetts: Austen Riggs Foundation, Inc., 1940.

This book is an analysis of cases treated at Stockbridge between 1910 and 1934. In the twenty-five year period the effect of changing therapy is apparent. The clinical records have been amplified by correspondence and follow-up visits. The individual case reports are few, but 1,060 cases out of 5,300 were reviewed. In general, the patients were psychoneurotic, for Dr. Rigg's practice was confined to this type of patient for many years. When the Riggs Associates was formed in 1937, it carried on the work of the Austen Riggs Foundation, which had been established in 1917 for the service of patients who were unable to pay the usual fees of private psychiatrists. Miss Raymond and Dr. Coon describe the limitations of the psychoneurotic and of the classification of "psychoneurosis" early in the book. They discuss the difficulties of differential diagnosis and the methodology of treatment at Stockbridge. There the feeling has been strong that (*a*) a balance of the day's activity, (*b*) the habit of accepting reality, (*c*) the habit of living in the present and (*d*) a consistent purpose expressed in useful work are ideals which are of maximum importance in directing a patient to a resumption of an integrated behavior pattern. Reeducation at Stockbridge appears to have a place midway between the persuasive method of Dubois (so called) and the psychobiologic approach of Adolf Meyer. The book testifies to the perception and analytic skill of the authors.

Las artritis gonocócicas agudas: Su diagnóstico y tratamiento médico. Tesis de doctorado de Enrique A. A. Pierini. Universidad nacional de Buenos Aires, Facultad de ciencias médicas, N.° 5314. Paper. Pp. 339, with 32 illustrations. Buenos Aires: Imprenta de Alfredo Frascoli, 1940.

The author selected the subject of diagnosis and medical treatment of acute gonorrheal arthritis for his doctoral thesis. The various chapters cover clinical forms, symptoms, course, diagnosis, prognosis and pathologic anatomy of acute gonorrheal arthritis; clinical, roentgen and differential diagnosis and the various methods of medical, surgical and physical treatments, vaccines and local antigonorrheal serotherapy. The sixth chapter is a report of clinical results obtained from local antigonorrheal serotherapy. The book ends with forty-five pages of bibliography.

Urban Housing and Crowding: Relation to Certain Population Characteristics as Indicated by National Health Survey Data. By Rollo H. Britten, Senior Statistician, and J. E. Brown, Assistant Statistician, U. S. Public Health Service. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 261. Paper. Price, 15 cents. Pp. 123, with 5 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

The obvious is thoroughly demonstrated by diagrams and statistics in this study. It is proved beyond doubt that crowding is much worse in the lower than in the higher income class, among Negroes rather than white persons, with large families more than small, in residencies with low rentals rather than high, in rented greater than in owner occupied, and in general was less in the West than in the Northeast and South. Possibly a housing program might find some of these figures valuable, but they certainly reveal nothing new.

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Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

STERILIZATION OF CATGUT

To the Editor:—What solutions are commonly employed inside the ampules which contain suture material? Are any of them to be particularly recommended? Have any of them been condemned? I have often noticed a smell of benzine when breaking such an ampule. What is the origin of this odor? Does the ampule contain free benzine? I notice in Johnson and Johnson's advertisements that they use 95 per cent alcohol with potassium mercuric iodide. Is either the alcohol or the mercuric salt capable of irritating tissues? Do you have a record of the solution employed at the present time by Bauer and Black? Is there a listing of approved sutures? What is the difference between boilable and nonboilable sutures? What would happen if one were to boil a nonboilable suture?

Percy J. Delano, M.D., Chicago.

ANSWER.—These questions cannot be answered satisfactorily without reference to the fundamental problem of the sterilization of catgut. It has been abundantly demonstrated that chemical agents alone cannot be relied on to sterilize catgut; heat must be used, and in a manner which will not spoil the material for surgical purposes.

"Boilable" catgut is first dehydrated, is then placed in sealed glass tubes containing an inert, anhydrous liquid, and finally is subjected to high temperature for long periods (e. g. 165 C. for five hours). The tubing fluid ordinarily used for this type of gut is xylene (dimethylbenzene) or toluene (methylbenzene), since both of these substances possess desirable qualities of colorlessness, stability, volatility and low toxicity (Bauer and Black use pure xylene or toluene for "boilable" catgut, and 95 per cent alcohol denatured with agents such as potassium mercuric iodide or phenyl mercuric benzoate for "nonboilable" catgut). Boiling or autoclaving these tubes before operation does not injure the enclosed gut and is recommended for the purpose of sterilizing the outer surface of the glass. It is a mistake, however, to think that any lack of sterility within the tubes can be rectified by such procedures, for temperatures of 120 C. or less for fifteen to twenty minutes cannot be depended on to kill sporulating organisms suspended in inert anhydrous mediums. This is one reason why it is imperative that all tubed catgut on the open market should be unquestionably sterile. When "boilable" catgut has been removed from its tube, the liquid quickly evaporates, leaving the strand perfectly dry and rather stiff. A desirable degree of pliability may be restored slowly by immersing the gut in 95 per cent alcohol, more rapidly by dipping it in physiologic solution of sodium chloride, and most rapidly of all by using first alcohol and then salt solution. This softening, which is due to the taking up of water by the dehydrated gut, may reduce the tensile strength slightly; but it is a process which occurs anyhow as soon as the catgut is buried in tissues.

The advantage claimed for "nonboilable" catgut is that the strand comes from the tube already soft and pliable. More steps are required in its manufacture, however, which of necessity increase the difficulty of producing a uniformly sterile suture material. The accepted method is to dehydrate the gut, sterilize it in open tubes by heat in an anhydrous medium such as cumene, drain off this liquid, add an antiseptic fluid and finally seal the tubes hermetically. The tubing fluid ordinarily used for "nonboilable" catgut is 95 per cent alcohol containing potassium mercuric iodide or some similar denaturing agent. In case of catgut affixed to needles in the tube at least one company (Davis & Geck) uses as tubing fluid anhydrous ethyl alcohol containing 0.5 per cent benzene and 0.2 per cent thymol. Irritation of tissues by these chemicals is probably unusual, especially if the catgut is rinsed in salt solution before use. "Nonboilable" catgut should not be boiled, because "the collagen of the suture in the presence of moist heat is partially converted into gelatin, thereby destroying the tensile strength and rendering the suture brittle" (Manual of Surgical Sutures and Ligatures, Brooklyn, Davis & Geck, Inc., 1935). It is necessary therefore to attempt to disinfect the outside of "nonboilable" catgut tubes by submerging them for adequate periods in germicidal solutions.

Beginning Jan. 1, 1941 the Federal Food and Drugs Administration assumed control over sterile surgical supplies (including catgut) manufactured for sale (Meleney, F. L.: Sterile Surgical Supplies, editorial, *Surgery* **8**:884 [Nov.] 1940). Official standards for sterility of catgut are indicated in the latest Supplement of the U. S. Pharmacopeia (Second Supplement to the Pharmacopeia of the United States, Eleventh Decennial Revision, Easton, Pa., Mack Printing Company, 1919, pp. 40 and 124). Efforts are being made to have these standards extended to include qualities of tensile strength and absorbability. Perhaps this will lead to further standardization of tubing fluid also. It is already required that each package of catgut shall state "the lot number identifying the methods and the time of sterilization of the gut, and the composition of any tubing fluid used." But as yet there is no official listing of approved sutures or of those firms whose catgut measures up consistently to the standards already established (Brewer J. H.: The Present Status of the Sterility of Catgut Sutures on the American Market, THE JOURNAL, Feb. 27, 1937, p. 722).

TREATMENT OF SEROLOGICALLY NEGATIVE SYPHILIS IN PREGNANCY

To the Editor:—A white woman aged 30, a primigravida, had a chancre and secondary rash in 1932. Blood tests for syphilis gave positive results at that time. The patient had intensive treatment with arsenicals and bismuth compounds (exact amounts not known) from 1932 until 1935 by a competent dermatologist. Her blood serum and spinal fluid became negative and have remained normal since 1935. At the present time she is two and one-half months pregnant. The Kahn, Kline and Wassermann reactions of the blood are all negative. The Kahn, Kline and Wassermann reactions as well as the colloidal gold reaction of the spinal fluid are negative. There are 1 to 2 cells per cubic millimeter of spinal fluid. Protein is not increased by the Pandy test. There are no clinical or neurologic signs of syphilis. Should this patient receive antisyphilitic therapy? If so, what type? What are the reasons for this recommendation? As a corollary to this, what is the rationale for the statement "A syphilitic woman should have treatment during each and every pregnancy, regardless of the serology and state of the disease"?

M.D., Nebraska.

ANSWER.—The patient has apparently had good treatment in the past for her syphilis, and the chances are good that even if she was not to have treatment there would be no difficulty.

The situation with a pregnancy, however, is somewhat different from what it is with the ordinary contacts in life, even sexual intercourse. It is generally understood that a biologic cure in syphilis probably is extremely difficult. A clinical cure and even a cure of the disease to such an extent that laboratory tests will no longer show any evidence of the disease is not out of the question. However, it is possible that such patients may still have a few stray organisms lodged away somewhere in the haversian canals or in some of the lymph nodes, and under the unusual stimulation that goes on in connection with a pregnancy it might be possible that a few of these organisms would get into the blood stream, and through the intimate contact between the fetus and the mother, by way of the placenta, it would be possible for some of them to lodge in the placenta and be carried through into the circulation of the fetus.

It is for this reason that the patient should have antisyphilitic treatment throughout her pregnancy.

Perhaps some time in the future sufficient statistical data will have been gathered to show that this is not necessary. Thus far, however, it has not been done.

A patient like the one described may be given a course of injections of mapharsen, each 40 mg., given once a week for a period of ten treatments. This may be followed with a short course of intramuscular injections of bismuth subsalicylate and a course of injections of mapharsen, the treatment being given right up until delivery.

ALLERGY AND EPINEPHRINE SENSITIVITY

To the Editor:—A patient with asthma is sensitive to many things: house dust, orris root powder, oranges and other substances. One cc. of epinephrine is the only thing which relieves her asthma. Three months ago she received four injections of 1 cc. of epinephrine with only slight palpitations of short duration. On March 1 another attack of asthma occurred. I gave her 1 cc. of epinephrine. (I am sure the injection was not in a blood vessel, as I always pull the plunger before giving an injection.) Such severe palpitations developed that it was hard for her to breathe. They lasted one and one-half hours until finally I gave her pentobarbital sodium and the palpitations subsided. I do not dare to give her epinephrine. Ephedrine does not help her.

M.D., Michigan.

ANSWER.—The inquiry does not give sufficient information regarding the full details of the patient's allergy; i. e., the history in detail and a complete study made including complete cutaneous tests, for a thorough answer regarding management. In general, those things which have been mentioned of an environmental nature, house dust and orris root, can and should be eliminated by the use of cosmetics free from orris root and of impervious covers over the mattress and pillows. Other precautions against house dust, especially in the bedroom, by

the elimination of drapes and upholstered furniture, should likewise be taken. It may be necessary to treat with those environmental substances to which the patient is sensitive and which cannot be thoroughly eliminated. It is presumed that the foods to which the patient reacts and to which she is clinically sensitive have been eliminated from her diet. As for the reaction described to injections of epinephrine, the amount given with each injection, 1 cc., is in most cases considered excessive. Generally speaking, 0.3 to 0.5 cc. of a 1:1,000 solution of epinephrine is all that should be given. If no relief is obtained from that dose, none will usually be obtained from a larger dose. All that will result from giving a larger dose are the undesirable side effects of epinephrine which are partly described in this case. It is not uncommon if a patient is in contact with a substance to which he is sensitive to find that epinephrine fails to give relief. Thus a patient sensitive to feathers, sleeping on unprotected feather pillows, will have no relief from solution of epinephrine. This is likewise true of many pollen-sensitive patients during the season for pollen. It might be well to try, for relief in this case, epinephrine in oil or epinephrine in gelatin; 0.5 cc. of either of these two solutions may be injected deep, subcutaneously or intramuscularly. For better results, 0.2 to 0.3 cc. of an aqueous solution of epinephrine (1:1,000) may be used immediately preceding the oil or gelatin suspension of this drug. If this is done, the injections are given separately and at different sites. Generally, if aqueous solution of epinephrine fails to give relief the oil suspension likewise fails to give relief. Another suggestion in severe attacks if epinephrine does not work is the slow intravenous administration of 7½ grains (0.5 Gm.) of aminophylline.

PYORRHEA ALVEOLARIS

To the Editor:—What is the cause of pyorrhea alveolaris? In a fairly well advanced case with recession of the jawbone but with no dental or gingival symptoms, is there any local treatment or general treatment that might arrest the progress of the disease? Are calcium and vitamin D of any avail?

Angeline Mary Piscitelli, M.D., San Francisco.

ANSWER.—The causes of pyorrhea alveolaris are generally unknown, but it is suspected that a combination of local trauma or irritation and a subclinical systemic deficiency of unknown type may be etiologic factors.

In the absence of dental or gingival symptoms the implication is that the cause may be chiefly systemic. However, studies on calcium and ascorbic acid in the blood, as well as other blood chemistry, have generally failed to show deviation from the normal.

Slight but gradual recession of the gums and alveolar bone is a normal senile change in older persons, associated with the continuous though slow eruption of the teeth. It should not be confused with pyorrhea alveolaris (periodontoclasia). The age of the patient is therefore important in the diagnosis.

Local treatment consisting of thorough sealing and removal of all irritating factors, such as calculus and detritus, is always indicated, as well as thorough medical examination and dietary analysis. Unfortunately this procedure is frequently not effective. Calcium and vitamin D therapy are indicated only when the systemic condition warrants such treatment. Surgical resection is not indicated in the absence of gingival symptoms.

HEMOGLOBIN DETERMINATION BY SANFORD-SHEARD METHOD

To the Editor:—What is the accepted value of normal blood by the Sanford-Sheard method of hemoglobin determination expressed as the amount in grams per hundred cubic centimeters of blood?

J. A. Mease Jr., M.D., Dunedin, Fla.

ANSWER.—The Sanford-Sheard instrument reads in grams of hemoglobin per hundred cubic centimeters. It is checked by the oxygen capacity method of determining hemoglobin and so should give the same readings as other accurate standard procedures. Several large series of hemoglobin determinations in normal persons have been reported with little variation in the average results. These run from 15 to 16 Gm. per hundred cubic centimeters. Sanford has stated that 16 Gm. is his average value.

In any method of determining hemoglobin the most satisfactory procedure is to determine for each laboratory the average value of hemoglobin in grams per hundred cubic centimeters for a normal red cell count of 5 million by the method used. This can be done accurately enough for all practical purposes by the careful study of at least 10 normal persons. The figure so determined is then taken as 100 per cent. The color index using this figure as 100 per cent should be 1.00 within the limits of error in normal persons.

ULTRAVIOLET RAYS AND THE SKIN

To the Editor:—Is there any danger from regular and repeated use of ultraviolet rays long enough to cause mild reddening of the skin followed by desquamation? A woman aged 29 had benefit to a cutaneous eruption with the General Electric sunlamp. The eruption appears as simple pustules resembling acne, leaving a faint pitting. Pustules and pitting have been benefited. Eller and Wolff's article on skin peeling in The Journal seems to explain the action.

M.D., Maine.

ANSWER.—One of the chief functions of the human skin is protection of the underlying tissues against the action of light. Normal skin is able to do this without being injured by the light, even though it is rather intense, provided the intensity comes on gradually. Repeated mild erythema doses of ultraviolet rays will not harm it. Only skins which are defective and lack the power of developing resistance to light can be harmed by such exposure. Such skins can usually be recognized by their inability to form pigment, freckling instead of tanning. These should not be exposed to strong light if it can be avoided, for fear that senile keratoses will develop, which are often the precursors of epithelioma. Such skins are not common. The patient mentioned in the query evidently profits by the treatment and there is little likelihood of injury.

EARLY TABES OR MENINGOVASCULAR SYPHILIS

To the Editor:—A man aged 43 has 3 plus blood and 4 plus spinal fluid Wassermann reactions after having had over thirty neoarsphenamine, sixty bismuth and recently over ten tryparsamide injections. His pupils are unequal and do not react to light. His knee jerk reflexes react sluggishly; the blood pressure is 100 over 70; no cardiovascular abnormalities are demonstrable. He has no complaints other than fatigue and insomnia. He refuses malaria fever therapy as well as any further spinal taps. What therapy can be used to prevent progression of his disease if not a cure? How much tryparsamide may be used in this type of case—over how long and should one allow rest periods? Are iodides of any value and, if so, what dosage?

Irving I. Crouse, M.D., Buffalo.

ANSWER.—If the patient's pupils are unequal and do not react to light and the reflexes are sluggish, he has symptomatic rather than asymptomatic neurosyphilis. Whether he has early tabes dorsalis or meningovascular neurosyphilis cannot be determined from the information furnished. If the spinal fluid is showing a severe degree of involvement, that is, the so-called paretic formula, the patient, barring contraindications, should have fever therapy. In view of his refusal to undergo such treatment, the continued use of tryparsamide and bismuth compounds is warranted. These drugs may be given concurrently, ten injections of each to a course, with a two month rest interval between courses, and effort should be made to give at least seventy-five injections of each drug. The use of iodides is advisable, giving up to 30 minims (3 cc.) three times a day if tolerated, otherwise maintaining as high a dose as the patient can comfortably take.

CONVALESCENT SCARLET FEVER SERUM

To the Editor:—In The Journal, Feb. 8, 1941, in the article "Chemotherapy of Infectious Diseases and Other Infections, Circular Letter 81," under Medical Preparedness, I notice the omission of the use of convalescent scarlet fever serum in the prevention and treatment of scarlet fever. Why do the "authorities" omit convalescent scarlet fever serum from the circular letter?

Harry G. Botman, M.D., Janesville, Ind.

ANSWER.—Convalescent scarlet fever serum was not included in circular letter 81 because its prophylactic use was not considered feasible in large numbers of persons and its field of therapeutic usefulness is still limited by the available supplies.

It is questionable whether widespread prophylaxis in scarlet fever is practicable in army camps, and there seems to be no great advantage for convalescent serum over the commercial serums which are now on the American market. This entire question, however, is subject to later modification if the evidence warrants.

CITRATES AND CORONARY THROMBOSIS

To the Editor:—I am puzzled by an answer to a query in the March 29, 1941, issue of The Journal. To the question of whether citrates were helpful in coronary thrombosis the answer was that the anticoagulant properties of the citrate radical were nullified. Since when does the citrate radical have such properties? So far as I know in regard to calcium and citrate the calcium radical is the determining one in blood coagulation. With the formation of a "relatively insoluble calcium citrate" less calcium is available for coagulation and hence coagulation is decreased. In the experiments in which sodium citrate was shown to increase coagulation, concentrations of 10 per cent were used. Concentrations of citrate over 3 per cent given intravenously may be toxic perhaps because of the destruction of platelets. In 2 per cent solution sodium citrate by vein decreases blood viscosity. (Bernheim, Alice R., and Landon, Isabel M.: Arteriosclerosis and Thromboangiitis Obliterans, The Journal, June 19, 1937, p. 2102). We have recently found that sodium citrate by mouth does increase citric acid in the blood.

Alice R. Bernheim, M.D., New York.